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METAL-MINE ACCIDENTS

IN THE

UNITED STATES

DURING THE CALENDAR YEAR 1921

BY

WILLIAM W. ADAMS

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METAL-MINE ACCIDENTS DURING THE CALENDAR YEAR 1921.

By WILLIAM W. ADAMS.

INTRODUCTION.

Fewer men were killed and injured by accidents in the metal mines in the United States in 1921 than in any previous year covered by the reports of operating companies to the Federal Bureau of Mines. Likewise, the number of men employed at the mines was smaller than in previous years, as was also the total shifts worked by the employees and the average number of workdays per man.

The operators' reports showed 93,929 employees, who worked 22,352,702 shifts during the year, an average of 238 days of work per man. Accidents killed 230 men and injured 18,604 others, thus indicating a fatality rate of 3.09 and an injury rate of 249.69 per thousand men employed, based upon a standard year of 300 working days. In 1920 the fatality rate was 3.16 and the injury rate was 242.02.

The reduction in total shifts worked by all employees in 1921 amounted to 45 per cent as compared with 1920. This loss was largest for copper mines and least for gold and silver mines. The actual reductions in the number of shifts worked was 60 per cent for copper mines, 53 per cent for iron mines, 51 per cent for the lead and zinc mines in the Mississippi Valley States, 31 per cent for nonmetalic mineral mines (excluding coal), and 15 per cent for mines of the gold and silver group.

SCOPE OF STATISTICS.

The tables presented in this paper are based on reports representing 2,896 mine operators, or 385 less than in 1920. The reports were received directly from the operating companies in all States except Alaska and California, where the reports were furnished by the Territorial mine inspector and the State industrial commission, respectively. The reports from Arizona, Idaho, and Utah were received by the bureau in cooperation with the State mine inspector for each of those States. The reports for all States cover prospects as well as producing and nonproducing mines and cover mines operated all or part of the year. They are voluntary responses to the bureau's request, for no Federal law requires such reports to be rendered. It is believed that the figures published are reasonably complete for the entire metal-mining industry.

The tables in the following pages are arranged so as to represent five divisions of the mining industry as follows:

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Copper mines.—This group comprises all of the copper mines and prospects reported in operation in the various copper-producing States.

Gold, silver, and miscellaneous metal mines.—This group comprises the gold mines (both lode and placer), silver mines, lead-silver mines, gold-silver mines, the lead and zinc mines other than those in the Mississippi Valley, and the mines working ores of quicksilver, manganese, tungsten, vanadium, chromium, etc. Also, pyrite mines are included, as the cinder is used in some metallurgical works for its iron and copper content, and bauxite mines because bauxite is the main source of metallic aluminum.

Iron mines.—All of the important iron mines, representing 122 operators, are included in this group.

Lead and zinc mines (Mississippi Valley).—This group comprises the lead and zinc mines of the Mississippi Valley only.

Nonmetallic mineral mines.—The nonmetallic mineral mines include those producing asbestos, asphaltum, baryte, diamond, emery, feldspar, flint, fluorspar, garnet, graphite, gypsum, kaolin, lithia, magnesite, mica, mineral paint, phosphate rock, quartz, salt, soapstone, sulphur, talc, tripoli, and turquois. Coal mines are not included.

ACKNOWLEDGMENTS.

The Bureau of Mines thanks the mine operators and State mine officials whose cooperation since the establishment of the bureau has made possible an annual statistical study for the United States. Special mention should be made of the assistance rendered by the State mine officials of Alaska, Arizona, California, Idaho, and Utah. The author's acknowledgments are due to Miss Mary Bringhurst, of the Bureau of Mines, for assistance in the compilation of the tables presented herein.

PUBLICATION OF ACCIDENT STATISTICS.

The bureau hopes that the distribution of information on accidents at metal mines will help to establish a uniform basis for recording and reporting mine accidents, the number of men employed, and the number of days or hours of work performed. When all mine-accident statistics are thus placed on the same basis, the making of comparisons and the drawing of conclusions will be rendered much easier, and safety work at mines will be facilitated.

Many States at present have no inspectors for metal mines; the reports issued by the various States lack uniformity, as the fiscal years are not the same and the mines subject to inspection differ; moreover, the States do not agree on what constitutes an injury, and indeed do not all agree in defining the term "fatal accident." Again, compensation laws in most States apply to all mines, but in some they are elective at the option of the operator.

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The Bureau of Mines will be glad to receive suggestions, from State inspectors and other persons interested in mining, as to the form in which accident statistics can be presented most effectively and their publication made most useful to the mining industry.

In addition to the statistical report on accidents at metal mines, the bureau issues yearly separate reports covering fatal and nonfatal accidents at mills and smelters, quarries, and coke ovens, and fatal accidents at coal mines. Copies of these reports may generally be obtained free of charge by applying to the Director, Bureau of Mines, Washington, D. C.

CLASSIFICATION OF INJURIES.

The bureau's classification of serious and slight injuries has been on a 14-day (2 weeks) basis since 1915. Prior to that year an injury was not classified as serious unless it resulted in a loss of time of more than 20 days. Details by States and causes for the year 1921 are given in Tables 19 and 20.

The classification and the number of injuries for each group since 1915 are as follows:

Fatal, serious, and slight injuries, 1915 to 1921.

Injury.	1915	1916	1917	1918	1919	1920	1921
1. Fatal	553	697	852	646	468	425	230
2. Serious (time lost more than 14 days):							
A. Permanent disability—							
Total [1]	35	44	39	62	7	12	7
Partial [2]	574	693	666	640	321	345	173
B. Others	7,242	10,099	10,220	9,066	7,848	7,894	4,817
3. Slight (time lost, 1 to 14 days, inclusive)	27,444	37,401	35,361	33,147	23,330	24,311	13,607
Total nonfatal injuries	35,295	48,237	46,286	42,915	31,506	32,562	18,604

[1] Permanent total disability: Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis or other condition permanently incapacitating workman from doing any work of a gainful occupation.

[2] Permanent partial disability: Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

ACCIDENT STATISTICS, BY STATES.

A compilation of the accident statistics for all metal mines operated in 1921, by causes and States, is given in Tables 3, 4, and 5. Tables 35 to 42, inclusive, give summary data, by States and years, relating to labor, accidents, etc., for the five-year period 1917 to 1921, inclusive. The fatalities and injuries are further classified to show the causes of the accidents in each group of mines. (Tables 17 and 18.)

CAUSES AND DISTRIBUTION OF ACCIDENTS.

Tables 16, 17, and 34 show the number of deaths and injuries from any one cause in each group of mines and for all the mines combined. Table 18 shows the percentage of fatalities and injuries due to any one cause for the year 1921. At the bottom of Table 17 is given a similar percentage covering the 10-year period 1911 to 1920 for the United States as a unit.

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TABLE 1.—***ALL MINES:*** *Men employed, and number killed and injured, by kinds of mines, during the years ended December 31, 1921 and 1920.*

1921.

Kind of mine.	Active operators.	Men employed.			Average days active.	Days of labor performed.			Number killed.			Number injured. (Time lost, more than 1 day.)			Widows.	Orphans.
		Underground.	Surface.	Total.		Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface.	Total.		
Copper	357	12,865	5,435	18,300	244	3,258,838	1,202,458	4,461,296	49	6	55	4,073	649	4,722	27	39
Gold, silver, and miscellaneous metal	2,135	17,642	8,874	26,516	269	4,963,389	2,158,013	7,121,402	66	12	78	4,439	913	5,352	25	34
Iron	122	17,501	13,058	30,559	210	3,434,610	2,975,963	6,410,573	45	20	65	3,126	1,381	4,507	43	108
Lead and zinc (Mississippi Valley)	66	5,302	1,646	6,948	234	1,259,899	369,292	1,629,191	14	.....	14	1,875	187	2,062	9	32
Nonmetallic mineral	216	2,630	8,976	11,606	235	642,532	2,087,708	2,730,240	8	10	18	627	1,334	1,961	8	19
Total, 1921	**2,896**	**55,940**	**37,989**	**93,929**	**238**	**13,559,268**	**8,793,434**	**22,352,702**	**182**	**48**	**230**	**14,140**	**4,464**	**18,604**	**112**	**232**

1920.

Copper	387	23,671	11,583	35,254	317	7,419,225	3,762,894	11,182,119	107	21	128	9,624	2,423	12,047	46	78
Gold, silver, and miscellaneous metal	2,358	20,077	9,856	29,933	279	5,806,783	2,548,047	8,354,830	100	17	117	4,794	910	5,704	37	56
Iron	154	25,627	20,363	45,990	295	7,483,915	6,090,873	13,574,788	86	20	106	6,734	2,338	9,072	60	130
Lead and zinc (Mississippi Valley)	119	8,861	2,777	11,638	283	2,466,250	833,028	3,299,278	33	3	36	3,223	384	3,607	19	28
Nonmetallic mineral	263	3,149	10,619	13,768	287	888,214	3,062,664	3,950,878	8	30	38	571	1,561	2,132	18	24
Total, 1920	**3,281**	**81,385**	**55,198**	**136,583**	**296**	**24,064,387**	**16,297,506**	**40,361,893**	**334**	**91**	**425**	**24,946**	**7,616**	**32,562**	**180**	**316**

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TABLE 2.—***ALL MINES:*** *Fatalities and injuries per 1,000 300-day workers employed during the years ended December 31, 1911 to 1921.*

Kind of mine.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers.		
	Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface.	Total.
1921.									
Copper	10,863	4,008	14,871	4.51	1.50	3.70	374.94	161.93	317.53
Gold, silver, and miscellaneous metal	16,545	7,193	23,738	3.99	1.67	3.29	268.30	126.93	225.46
Iron	11,449	9,920	21,369	3.93	2.02	3.04	273.04	139.21	210.91
Lead and zinc (Mississippi Valley)	4,200	1,231	5,431	3.33	.....	2.58	446.43	151.91	379.67
Nonmetallic mineral	2,142	6,959	9,101	3.73	1.44	1.98	292.72	191.69	215.47
Total, 1921	**45,199**	**29,311**	**74,510**	**4.03**	**1.64**	**3.09**	**312.84**	**152.29**	**249.69**
1920.									
Copper	24,731	12,543	37,274	4.33	1.67	3.43	389.15	193.18	323.20
Gold, silver, and miscellaneous metal	19,356	8,493	27,849	5.17	2.00	4.20	247.68	107.15	204.82
Iron	24,946	20,303	45,249	3.15	.99	2.31	269.94	115.16	200.49
Lead and zinc (Mississippi Valley)	8,221	2,777	10,998	4.01	1.08	3.27	392.04	138.28	327.97
Nonmetallic mineral	2,961	10,209	13,170	2.70	2.94	2.89	192.84	152.90	161.88
Total, 1920	**80,215**	**54,325**	**134,540**	**4.16**	**1.68**	**3.16**	**310.99**	**140.19**	**242.02**
Total, 1919	85,769	43,102	131,871	4.52	1.63	3.47	289.16	136.55	233.60
Total, 1918	113,441	67,565	181,006	4.52	1.97	3.57	290.61	147.24	237.09
Total, 1917	123,815	68,270	192,085	5.73	1.92	4.44	289.83	146.02	240.97
Total, 1916	125,601	66,854	192,455	4.57	1.84	3.62	306.12	146.41	250.64
Total, 1915	89,821	52,176	141,997	5.02	1.95	3.89	319.85	125.84	248.56
Total, 1914	91,659	50,960	142,619	5.08	1.82	3.92	261.81	122.04	211.87
Total, 1913	121,293	62,300	183,593	4.52	2.17	3.72	210.44	119.52	179.59
Total, 1912	105,153	55,509	161,662	4.96	2.46	4.09	236.42	103.95	190.11
Total, 1911	98,389	57,700	156,089	5.51	2.65	4.45	217.28	90.10	170.27

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TABLE 3.—***ALL MINES:*** *Men employed, number killed, and days worked, by States, during the year ended December 31, 1921.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	Surface.	**Total.**	Underground.	Surface.	Total.		Underground.	Surface.	**Total.**		
Alabama	15	3,338	1,492	**4,830**	579,063	262,668	841,731	174	5	.....	**5**	2	7
Alaska	434	975	1,761	**2,736**	268,541	350,539	619,080	226	7	6	**13**	2	.....
Arizona	280	4,918	2,070	**6,988**	1,194,479	480,899	1,675,378	240	22	1	**23**	10	9
Arkansas	6	3	218	**221**	300	45,068	45,368	205	.....	.....	.....	.....	.....
California[1]	201	2,788	1,949	**4,737**	841,990	507,602	1,349,592	285	14	3	**17**	5	10
Colorado	344	2,781	1,027	**3,808**	727,606	253,569	981,175	258	15	.....	**15**	6	10
Connecticut[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Florida	18	.....	3,283	**3,283**	.....	706,017	706,017	215	.....	5	**5**	3	4
Georgia	11	31	227	**258**	4,490	38,908	43,398	168	.....	.....	.....	.....	.....
Idaho	314	2,458	917	**3,375**	643,525	199,402	842,927	250	8	1	**9**	2	6
Illinois	6	313	268	**581**	35,440	21,287	56,727	98	1	.....	**1**	1	1
Iowa	7	263	32	**295**	55,768	6,520	62,288	211	1	.....	**1**	.....	.....
Kansas	15	657	211	**868**	131,352	45,630	176,982	204	1	.....	**1**	.....	.....
Kentucky	9	113	217	**330**	17,980	57,771	75,751	230	.....	.....	.....	.....	.....
Maine	3	.....	32	**32**	.....	6,560	6,560	205	.....	.....	.....	.....	.....
Maryland	4	.....	35	**35**	.....	3,849	3,849	110	.....	.....	.....	.....	.....
Massachusetts	3	19	9	**28**	4,880	1,450	6,330	226	.....	.....	.....	.....	.....
Michigan	49	10,797	5,154	**15,951**	2,478,944	1,074,069	3,553,013	223	39	4	**43**	33	66
Minnesota	41	4,366	7,048	**11,414**	915,844	1,836,825	2,752,669	241	7	16	**23**	14	31
Missouri	17	2,597	1,482	**4,079**	791,033	388,762	1,179,855	289	8	.....	**8**	5	27
Montana	189	4,043	1,219	**5,262**	1,198,726	342,394	1,541,120	293	12	1	**13**	5	6
Nevada	277	2,362	1,023	**3,385**	643,347	264,823	908,170	268	7	1	**8**	1	2
New Hampshire	4	18	40	**58**	4,134	8,630	12,764	220	.....	.....	.....	.....	.....
New Jersey	5	852	310	**1,162**	161,918	44,161	206,079	177	3	.....	**3**	3	6
New Mexico	79	1,612	737	**2,349**	240,719	116,808	357,527	152	1	1	**2**	2	5
New York	22	1,742	779	**2,521**	381,452	180,893	562,345	223	11	1	**12**	7	27
North Carolina	11	57	266	**323**	6,705	48,559	55,264	171	.....	.....	.....	.....	.....
Ohio	3	180	44	**224**	48,990	11,506	60,496	270	3	.....	**3**	.....	.....
Oklahoma	29	1,510	303	**1,813**	279,098	55,379	334,477	184	3	.....	**3**	3	4
Oregon	118	283	204	**487**	29,611	32,399	62,010	127	1	1	**2**	1	1
Pennsylvania	8	69	235	**304**	19,489	28,526	48,015	158	.....	.....	.....	.....	.....
South Carolina[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	30	944	704	**1,648**	316,143	238,950	555,093	337	.....	1	**1**	1	2
Tennessee	16	999	1,222	**2,221**	214,655	238,434	453,089	204	3	1	**4**	4	7
Texas	9	180	580	**760**	61,810	144,559	206,369	272	.....	.....	.....	.....	.....
Utah[3]	160	3,179	822	**4,001**	994,036	200,010	1,194,046	298	7	3	**10**	.....	.....
Vermont	4	40	24	**64**	11,120	5,676	16,796	262	.....	.....	.....	.....	.....
Virginia	15	320	714	**1,034**	72,554	189,561	262,115	253	2	.....	**2**	2	1
Washington	99	283	145	**428**	42,798	20,755	63,553	148	.....	.....	.....	.....	.....

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Wisconsin	16	653	254	907	105,365	50,210	155,575	172	1			1		
Wyoming	19	123	172	295	17,974	27,491	45,465	154		1		1		
Other States	6	74	700	834	17,329	256,315	273,644	328		1		1		
Total, 1921	**2,896**	**55,940**	**37,989**	**93,929**	**13,559,268**	**8,793,434**	**22,352,702**	**238**	**182**	**48**		**230**	**112**	**232**
Total, 1920	**3,281**	**81,385**	**55,198**	**136,583**	**21,064,387**	**16,297,506**	**40,361,893**	**296**	**334**	**91**		**425**	**180**	**316**

[1] All data in this and other tables for 1921 supplied by the Industrial Accident Commission of California.
[2] Not segregated.
[3] Accident data supplied by the Industrial Commission of Utah.

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TABLE 4.—*ALL MINES: Fatalities, by causes and States*

State.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Alabama	1				4					
Alaska				2	1	2				
Arizona	10			7		1	1			
Arkansas										
California	6									
Colorado	5			1	1	1	1			
Connecticut[1]										
Florida										
Georgia										
Idaho	1		1	1	1	2	2			
Illinois				1						
Iowa										
Kansas										
Kentucky										
Maine										
Maryland										
Massachusetts										
Michigan	16	1		2	1	3				
Minnesota	2	1		1					1	
Missouri	6					1				
Montana	3			2	1	1				
Nevada	1			1		1			1	
New Hampshire										
New Jersey	3									
New Mexico										
New York	3			1						
North Carolina										
Ohio	2									
Oklahoma	2			1						
Oregon							1			
Pennsylvania										
South Carolina[1]										
South Dakota										
Tennessee	1					1				
Texas										
Utah	4									
Vermont										
Virginia	1									
Washington										
Wisconsin	1									
Wyoming										
Other States										
Total, 1921	**68**	**2**	**1**	**20**	**9**	**13**	**5**		**2**	
Total, 1920	138	9	3	44	29	18	6	3	9	1

[1] Not segregated.

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during the year ended December 31, 1921.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total, underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
					5							
					5	1	1					2
					19	1	2					3
				3	9	4				1		5
	4				13		1				1	2
					8							
					1							
				1	1							
						1						1
	1			2	26	7				6		13
					5	1	1					2
				1	8							
				2	9	1	1			1		3
					4	2				1		3
					3							
						1						1
				1	5	1	1			4		6
					2	1						1
					3							
					1							
					2	1						1
				1	5					2		2
					1					1		1
					1							
	5			11	136	22	7			16	1	46
	7			13	280	22	6	1		20	5	54

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TABLE 4.—*ALL MINES: Fatalities, by causes and States,*

State.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Alabama										
Alaska	3								3	6
Arizona								1		1
Arkansas										
California				1					1	2
Colorado										
Connecticut [1]										
Florida							1	1		2
Georgia										
Idaho	1									1
Illinois										
Iowa										
Kansas										
Kentucky										
Maine										
Maryland										
Massachusetts										
Michigan						1			2	3
Minnesota	1			1					1	3
Missouri										
Montana									1	1
Nevada									1	1
New Hampshire										
New Jersey										
New Mexico	1									1
New York									1	1
North Carolina										
Ohio										
Oklahoma										
Oregon									1	1
Pennsylvania										
South Carolina [1]										
South Dakota				1						1
Tennessee										
Texas										
Utah				2			1			3
Vermont										
Virginia										
Washington										
Wisconsin										
Wyoming										
Other States		1								1
Total, 1921	**6**	**1**		**5**		**1**	**2**	**2**	**11**	**28**
Total, 1920	5	9	1	2			7	9	20	53

[1] Not segregated.

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during the year ended December 31, 1921—Continued.

Open pit.												
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.	Grand total.
31	32	33	34	35	36	37	38	39	40	41		
												5
												13
												23
	1										1	17
												15
2										1	3	5
												9
												1
												1
												1
	1										1	43
	1	5	4		2	1					13	23
												8
												13
												8
												3
												2
												12
												3
												3
												2
1											1	1
												4
												10
												2
1											1	1
												1
4	3	5	4		2	1				1	20	230
4	13	8	5	3				2		3	38	425

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TABLE 5.—*ALL MINES: Injuries, by causes and States,*

State.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Alabama	72	107	49	.....	183	15	3	20	3	4
Alaska	16	46	9	5	15	4	2	7	.....	2
Arizona	333	149	216	46	224	63	50	117	5	14
Arkansas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
California	260	98	65	10	89	89	.....	90	1	9
Colorado	138	64	63	11	62	26	3	91	.....	7
Connecticut [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Florida	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Idaho	137	70	128	4	62	61	3	50	3	3
Illinois	.....	2	.....	.....	.....	.....	.....	4	.....	.....
Iowa	5	5	4	4	2	.....	.....	1	1	1
Kansas	37	37	5	5	33	2	.....	24	2	9
Kentucky	12	.....	1	.....	.....	.....	.....	.....	.....	1
Maine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Massachusetts	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michigan	516	515	341	17	321	84	77	121	12	34
Minnesota	217	63	178	14	94	32	7	18	7	8
Missouri	82	254	3	27	157	5	5	49	5	9
Montana	231	78	82	6	101	15	1	27	2	6
Nevada	113	53	54	12	39	16	4	47	2	13
New Hampshire	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	9	23	5	2	10	3	2	6	.....	.....
New Mexico	39	15	7	3	19	1	6	7	.....	.....
New York	40	240	49	11	102	19	1	180	6	27
North Carolina	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	3	7	.....	24	11	.....	.....	.....	.....	.....
Oklahoma	98	121	6	4	55	26	8	109	1	6
Oregon	2	4	3	.....	3	1	.....	1	.....	.....
Pennsylvania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Carolina [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	31	164	30	11	92	1	20	87	.....	4
Tennessee	57	143	19	3	40	2	7	17	3	21
Texas	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Utah	241	5	163	9	106	31	16	73	3	13
Vermont	1	1	.....	.....	2	.....	.....	.....	.....	.....
Virginia	8	13	1	3	8	4	1	1	.....	5
Washington	4	1	.....	.....	1	.....	.....	.....	.....	.....
Wisconsin	7	22	6	.....	17	1	1	8	.....	1
Wyoming	4	2	.....	.....	.....	.....	.....	.....	1	.....
Other States	3	.....	.....	.....	1	.....	.....	.....	.....	.....
Total, 1921	**2,717**	**2,303**	**1,487**	**232**	**1,849**	**501**	**217**	**1,155**	**57**	**197**
Total, 1920	5,319	3,912	2,635	406	3,395	685	437	1,802	65	318

[1] Not segregated.

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during the year ended December 31, 1921.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total, underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
			1	106	563	2	1			3		6
			2	32	140	1			1	3	3	8
	1		32	308	1,558	4	8			5	16	33
	6		47	173	937	9	8			21	11	49
	2		10	84	561		3			1	3	7
			36	160	717	1	9			10	8	28
				4	10		2					2
			1	10	34	15						15
			8	87	249		7				4	11
					14							
	4		44	415	2,501	5	30			43	18	96
			19	67	724	1	4			6	15	26
	1		11	181	789		3				7	10
			35	149	733		7			13	4	24
	12		15	51	431	1	1			6	3	11
				8	68						2	2
			1	7	105	3	3			2	5	13
			15	118	808	2	4			3	6	15
					1							
				5	50							
	3		11	158	606	1	13			8	9	31
			1	1	16							
			3	139	582						5	5
	1		3	60	376		2			3	2	7
					2					1		1
			46	240	946	5	7			8	11	31
	2			1	7							
			1	8	53	1				1		2
				2	8					1		1
			1	35	99	1	2			2	1	6
				1	8							
					4							
6	32		343	2,610	13,700	52	114		1	140	133	440
	66	1	624	4,463	24,134	72	229	7	9	252	243	812

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TABLE 5.—***ALL MINES:*** *Injuries, by causes and States,*

State.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Alabama	.....	1	3	3	8	19	.....	4	21	59
Alaska	6	.....	.....	4	2	2	1	7	46	68
Arizona	12	3	.....	22	7	20	2	17	88	171
Arkansas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
California	5	.....	.....	50	12	53	5	53	149	327
Colorado	10	.....	6	27	13	24	1	15	64	160
Connecticut [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Florida	4	29	.....	20	49	60	15	24	64	265
Georgia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Idaho	5	.....	1	10	2	13	1	7	49	88
Illinois	.....	.....	.....	1	.....	.....	.....	.....	3	4
Iowa	.....	.....	.....	.....	.....	.....	.....	.....	2	2
Kansas	.....	.....	.....	1	2	2	.....	3	30	38
Kentucky	.....	.....	.....	.....	.....	1	.....	1	.....	2
Maine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Massachusetts	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michigan	1	9	8	43	9	36	.....	28	211	345
Minnesota	16	11	.....	26	13	33	.....	25	80	204
Missouri	.....	3	.....	5	2	2	.....	2	63	77
Montana	5	1	1	9	8	27	.....	7	49	107
Nevada	5	1	.....	10	6	12	.....	7	27	68
New Hampshire	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	1	1	.....	2	1	3	.....	.....	4	12
New Mexico	7	.....	1	1	1	4	2	5	16	37
New York	4	12	14	18	27	42	11	24	85	237
North Carolina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	.....	.....	.....	.....	.....	.....	.....	.....	10	10
Oklahoma	1	1	.....	2	3	3	.....	8	44	62
Oregon	.....	.....	.....	1	.....	3	.....	.....	6	10
Pennsylvania	.....	.....	.....	2	.....	.....	.....	.....	.....	2
South Carolina [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	1	4	.....	1	1	15	1	10	32	65
Tennessee	11	3	1	6	7	4	.....	8	11	51
Texas	.....	.....	.....	27	28	44	1	26	129	255
Utah	9	2	.....	22	5	20	3	11	54	126
Vermont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Virginia	.....	2	1	3	.....	5	.....	8	26	45
Washington	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Wisconsin	3	.....	.....	1	.....	6	.....	1	7	18
Wyoming	.....	.....	.....	1	.....	2	.....	.....	.....	3
Other States	.....	.....	.....	16	47	10	.....	.....	119	192
Total, 1921	**106**	**83**	**36**	**334**	**253**	**466**	**43**	**301**	**1,489**	**3,111**
Total, 1920	298	167	78	526	401	693	51	560	2,270	5,044

[1] Not segregated.

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during the year ended December 31, 1921—Continued.

Open pit.												
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.	Grand total.
31	32	33	34	35	36	37	38	39	40	41		
1			1	3					4	5	14	642
1				1							2	218
6	2	13	3	6	1		2		10	21	64	1,826
1		2	2	1			1		4	5	16	16
1	1										2	1,315
2				1				1		1	5	733
4	6	9	6	24	3		21	2	26	151	252	517
		1							2	1	4	4
				1		1	1				3	836
												16
												51
												298
12	1	6		5			3		4	9	40	56
	1										1	1
7	3	1		7		2				16	36	2,978
62	8	91	86	76	7	3	22		82	269	706	1,660
												876
												864
19	2	12	1	2			3			21	60	570
		1									1	83
4		3	3	3					7	10	30	185
		1							1	5	7	1,067
												1
4										1	5	65
												699
												26
2		1		2					2	1	8	10
1											1	653
		3	3	1	1					3	11	445
										15	15	273
9	1	3		7			1		5	20	46	1,149
												7
2				4			2		1	5	14	114
												10
										2	2	125
4	1			1						1	7	18
1											1	197
143	26	147	105	145	12	6	56	3	148	562	1,353	18,604
280	90	267	222	171	22	1	156	7	328	1,028	2,572	32,562

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ACCIDENT STATISTICS, BY GROUPS OF MINES.

COPPER MINES.

Reports received from 357 companies operating copper mines during 1921 show that accidents caused 55 deaths and 4,722 nonfatal injuries. The number of employees was 18,300 and they worked a total of 4,461,296 shifts, an average of 244 workdays per man. The number of shifts represents a reduction of 60 per cent from the year before. The fatal-accident rate was 3.70 per thousand employees (300-day basis) and the injury rate was 317.53, as compared with a fatality rate of 3.43 and an injury rate of 323.20 in 1920.

The total shifts worked by underground employees at copper mines constituted 73 per cent of the labor performed by all copper-mine employees; accidents among these men resulted in 89 per cent of all fatalities and 86 per cent of all nonfatal injuries. Most of the nonfatal accidents underground resulted from falls of rock or ore from roof or wall, loading at working face or chute, haulage equipment, timber or hand tools, and drilling.

Surface employees (not including open-pit) performed 24 per cent of the total shifts and suffered 10 per cent of the nonfatal injuries. The main causes of accidents among surface workers at copper mines were hand tools, falls of persons, machinery, haulage, and nails and splinters.

The reports showed that only 2.6 per cent of the total shifts were worked at open-pit copper mines, with no fatalities among the men and 3.3 per cent of the injuries. Of these nonfatal accidents the majority were caused by falls or slides of rock or ore, hand tools, haulage, and falls of persons.

GOLD, SILVER, AND MISCELLANEOUS METAL MINES.

The figures for the "gold and silver" group of metal mines are based on the reports of 2,135 operators, who employed 26,516 men during 1921. The total number of shifts worked by all employees was 7,121,402, a decrease of 15 per cent below the year 1920, and each man averaged 269 workdays during the year as compared with 279 in the preceding year. Accidents resulted in 78 deaths and 5,352 nonfatal injuries, representing a fatality rate of 3.29 per thousand 300-day workers as compared with 4.20 in 1920, and an injury rate of 225.46 as compared with 204.82.

Men working underground worked 70 per cent of the total shifts at this group of mines; they suffered 85 per cent of the fatalities and 83 per cent of the nonfatal accidents. The main causes of accidents underground, in the order of their importance, were falls of rock or ore from roof or wall, timber or hand tools, rock or ore while loading at face or chute, haulage, drilling, and falling down chute, winze,

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raise, or stope. Shaft accidents resulted in about 21 per cent of all fatalities and less than 3 per cent of all injuries at the "gold and silver" group of mines.

Employees in surface shops and yards worked 28 per cent of the shifts for this group of mines and sustained 15 per cent of the fatal accidents and 16 per cent of the injuries. Most of the injuries resulted from hand tools, falls of persons, machinery, nails and splinters, and haulage equipment.

Open-pit workers performed slightly less than 2 per cent of the total man-days of labor and had less than 1 per cent of the nonfatal injuries; there were no fatalities. The principal causes of accidents among open-pit workers were hand tools, falls or slides of rock or ore, haulage equipment, steam shovels, falls of persons, and machinery.

IRON MINES.

According to the reports of 122 operating companies, the mining of iron ore in 1921 employed 30,559 men, who worked 6,410,573 shifts, an average of 210 shifts per man. The total number of shifts represents a loss of 53 per cent from the amount of work done at iron mines in 1920.

Accidents resulted in the death of 65 men and the injury of 4,507, indicating a fatality rate of 3.04 and an injury rate of 210.91 per thousand 300-day workers, as compared with a fatality rate of 2.34 and an injury rate of 200.49 in 1920.

Underground employees at iron mines worked 53 per cent of the total shifts, and had 69 per cent of the fatalities and 69 per cent of the injuries. Most of the injuries resulted from falls of rock or ore from roof or wall, timber or hand tools, haulage equipment, rock or ore while loading at face or chute, and drilling.

Open-pit and stripping operations were credited with 24 per cent of the total shifts worked at iron mines. The employees suffered 22 per cent of the fatalities and 17 per cent of the nonfatal injuries. The majority of the injuries were caused by haulage equipment, falls of persons, steam shovels, hand tools, and falls or slides of rock or ore, in the order stated.

Employees in surface shops and yards worked 23 per cent of the total shifts and received 9 per cent of the fatalities and 14 per cent of the injuries. The main causes of nonfatal accidents were hand tools, falls of persons, machinery, nails and splinters, and haulage equipment.

LEAD AND ZINC MINES.

Accidents at lead and zinc mines in the Mississippi Valley in 1921 resulted in the death of 14 men and the injury of 2,062. The number of men employed was 6,948; they worked 1,629,191 shifts, an average

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of 234 workdays per man. The total shifts worked was 51 per cent less than in 1920. The accident rates per thousand 300-day workers were 2.58 killed and 379.67 injured, as compared with 3.27 killed and 327.97 injured in the preceding year.

Of the total shifts worked, 77 per cent were by men employed underground. Among these employees all of the fatalities and 91 per cent of the injuries at lead and zinc mines occurred. Most of the injuries were caused by rock or ore while loading at face or chute, haulage equipment, falls of rock or ore from roof or wall, drilling, and machinery.

Men employed in surface shops and yards worked 22 per cent of the shifts and received nearly 9 per cent of the injuries. The main causes of accidents among this group of workers were machinery, hand tools, falls of persons, and nails and splinters.

Less than 1 per cent of the total shifts worked were in open-pit or stripping operations; in these there were no fatalities and only one-seventh of 1 per cent of the injuries.

NONMETALLIC MINERAL MINES.

Reports on accidents at mines producing nonmetallic minerals were received from 216 operators, who employed 11,606 men. Each man averaged 235 workdays during the year, the total shifts worked by all employees being 2,730,240, a reduction of 31 per cent from 1920. Accidents resulted in 18 deaths and 1,961 injuries among the employees, representing a fatality rate of 1.98 and an injury rate of 215.47 per thousand 300-day workers, as compared with a fatality rate of 2.89 and an injury rate of 161.88 in the preceding year.

Underground employees worked 24 per cent of the total shifts at nonmetallic mineral mines and had 44 per cent of the fatalities and 32 per cent of the injuries. The main causes of injuries were rock or ore while loading at face or chute, haulage equipment, falls of rock or ore from roof or wall, drilling, explosives, and timber or hand tools.

Employees engaged in open-pit mining and stripping operations worked 35 per cent of the shifts and received 33 per cent of all fatalities and 21 per cent of the injuries. Most of the injuries resulted from falls or slides of rock or ore, falls of persons, hand tools, haulage, and machinery.

Men employed in surface shops and yards worked 41 per cent of the shifts and received 22 per cent of the fatalities and 47 per cent of the injuries. Most of the injuries resulted from accidents caused by nails and splinters, hand tools, falls of persons, machinery, and railway cars.

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TABLE 6.—***COPPER MINES:*** *Men employed, number killed, and days worked, by States, during the year ended December 31, 1921.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	Surface.	**Total.**	Underground.	Surface.	**Total.**		Underground.	Surface.	**Total.**		
Alaska	5	288	127	**415**	102,880	40,707	**143,587**	346	2	3	**5**	.....	.....
Arizona	124	3,941	1,724	**5,665**	940,769	398,930	**1,339,699**	236	17	.....	**17**	8	9
California	14	351	119	**470**	115,086	40,004	**155,090**	330	.....	.....	.....	.....	.....
Idaho	33	172	42	**214**	35,648	7,637	**43,285**	202	.....	.....	.....	.....	.....
Michigan	16	3,459	1,657	**5,116**	895,301	334,089	**1,229,390**	240	16	1	**17**	13	22
Montana	31	2,681	747	**3,428**	805,745	220,979	**1,026,724**	300	8	1	**9**	3	1
Nevada	21	161	154	**315**	46,344	36,380	**82,724**	263	.....	.....	.....	.....	.....
New Mexico	21	846	370	**1,216**	93,688	39,490	**133,178**	110	.....	.....	.....	.....	.....
Oregon	16	90	15	**105**	4,269	557	**4,826**	46	.....	.....	.....	.....	.....
Utah	29	295	305	**600**	69,701	42,854	**112,555**	188	3	1	**4**	.....	.....
Washington	22	73	32	**105**	11,812	5,885	**17,697**	169	.....	.....	.....	.....	.....
Other States	25	508	143	**651**	137,595	34,946	**172,541**	265	3	.....	**3**	3	7
Total, 1921	**357**	**12,865**	**5,435**	**18,300**	**3,258,838**	**1,202,458**	**4,461,296**	**244**	**49**	**6**	**55**	**27**	**39**
Total, 1920	387	23,671	11,583	**35,254**	7,419,225	3,762,894	**11,182,119**	317	107	21	**128**	46	78

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TABLE 7.—***COPPER MINES:*** *Fatalities and injuries per 1,000, 300-day workers.*

State.	Number of 300-day workers.			Killed per 1,000, 300-day workers.			Injured per 1,000, 300-day workers.		
	Underground.	Surface.	**Total.**	Underground.	Surface.	**Total.**	Underground.	Surface.	**Total.**
Alaska	343	136	**479**	5.83	22.06	**10.44**	.....	.....	.....
Arizona	3,136	1,330	**4,466**	5.42	.....	**3.81**	.....	.....	.....
California	384	133	**517**	.....	.....	.....	.....	.....	.....
Idaho	119	25	**144**	.....	.....	.....	.....	.....	.....
Michigan	2,984	1,114	**4,098**	5.36	.90	**4.15**	.....	.....	.....
Montana	2,686	736	**3,422**	2.98	1.36	**2.63**	.....	.....	.....
Nevada	155	121	**276**	.....	.....	.....	.....	.....	.....
New Mexico	312	132	**444**	.....	.....	.....	.....	.....	.....
Oregon	14	2	**16**	.....	.....	.....	.....	.....	.....
Utah	232	143	**375**	12.93	6.99	**10.67**	.....	.....	.....
Washington	39	20	**59**	.....	.....	.....	.....	.....	.....
Other States	459	116	**575**	6.54	.....	**5.22**	.....	.....	.....
Total, 1921	**10,863**	**4,008**	**14,871**	**4.51**	**1.50**	**3.70**	**374.94**	**161.93**	**317.53**
Total, 1920	24,731	12,543	**37,274**	4.33	1.67	**3.43**	389.15	193.18	323.20

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TABLE 8.—**GOLD, SILVER, AND MISCELLANEOUS METAL MINES:** *Men employed, number killed, and days worked, by States, during the year ended December 31, 1921.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	Surface.	Total.	Underground.	Surface.	Total.		Underground.	Surface.	Total.		
Alaska	428	672	1,624	**2,296**	160,216	306,202	**466,418**	203	5	3	**8**	2	.....
Arizona	152	801	312	**1,113**	211,635	74,514	**286,149**	257	5	1	**6**	2	.....
California	164	2,307	1,685	**3,992**	697,414	433,115	**1,130,529**	283	14	2	**16**	5	8
Colorado	311	2,707	928	**3,635**	715,910	230,908	**946,818**	260	15	.....	**15**	6	10
Georgia	3	.....	121	**121**	.....	18,080	**18,080**	149	.....	.....	.....	.....	.....
Idaho	279	2,283	873	**3,156**	606,977	191,440	**798,417**	253	8	1	**9**	2	6
Montana	154	1,299	453	**1,752**	376,181	116,990	**493,171**	281	4	.....	**4**	2	5
Nevada	251	2,195	707	**2,902**	594,861	174,521	**769,382**	265	7	1	**8**	1	2
New Mexico	53	562	209	**771**	113,446	52,421	**165,867**	215	1	.....	**1**	1	.....
New York [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Carolina [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oregon	101	192	189	**381**	25,312	31,842	**57,154**	150	1	1	**2**	1	1
South Dakota	24	926	696	**1,622**	313,978	237,575	**551,553**	340	.....	1	**1**	1	2
Tennessee [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utah	115	2,736	443	**3,179**	885,337	141,310	**1,026,647**	323	3	2	**5**	.....	.....
Virginia [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington	73	208	65	**273**	30,786	8,268	**39,054**	143	.....	.....	.....	.....	.....
Wyoming	12	26	12	**38**	1,799	632	**2,431**	64	.....	.....	.....	.....	.....
Other States	15	728	557	**1,285**	229,537	140,195	**369,732**	288	3	.....	**3**	2	.....
Total, 1921	**2,135**	**17,642**	**8,874**	**26,516**	**4,963,389**	**2,158,013**	**7,121,402**	**269**	**66**	**12**	**78**	**25**	**34**
Total, 1920	**2,358**	**20,077**	**9,856**	**29,933**	**5,806,783**	**2,548,047**	**8,354,830**	**279**	**100**	**17**	**117**	**37**	**56**

[1] Not segregated.

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TABLE 9.—***GOLD, SILVER, AND MISCELLANEOUS METAL MINES:*** *Fatalities and injuries per 1,000 300-day workers.*

State.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers.		
	Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface.	Total.
Alaska	534	1,021	1,555	9.36	2.94	5.14	.....	.....	.....
Arizona	706	248	954	7.08	4.03	6.29	.....	.....	.....
California	2,325	1,444	3,769	6.02	1.39	4.25	.....	.....	.....
Colorado	2,386	770	3,156	6.29	.....	4.75	.....	.....	.....
Georgia	.....	60	60	.....	.....	.....	.....	.....	.....
Idaho	2,023	638	2,661	3.95	1.57	3.38	.....	.....	.....
Montana	1,254	390	1,644	3.19	.....	2.43	.....	.....	.....
Nevada	1,983	582	2,565	3.53	1.72	3.12	.....	.....	.....
New Mexico	378	175	553	2.65	.....	1.81	.....	.....	.....
New York [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Carolina [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oregon	84	106	190	11.90	9.43	10.53	.....	.....	.....
South Dakota	1,047	792	1,839	.....	1.26	.54	.....	.....	.....
Tennessee [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utah	2,951	471	3,422	1.02	4.25	1.46	.....	.....	.....
Virginia [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington	103	27	130	.....	.....	.....	.....	.....	.....
Wyoming	6	2	8	.....	.....	.....	.....	.....	.....
Other States	765	467	1,232	3.92	.....	2.44	.....	.....	.....
Total, 1921	**16,545**	**7,193**	**23,738**	**3.99**	**1.67**	**3.29**	**268.30**	**126.93**	**225.46**
Total, 1920	19,356	8,493	27,849	5.17	2.00	4.20	247.68	107.15	204.82

[1] Not segregated.

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TABLE 10.—*IRON MINES: Men employed, number killed, and days worked, by States, during the year ended December 31, 1921.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	Surface.	**Total.**	Underground.	Surface.	**Total.**		Underground.	Surface.	**Total.**		
Alabama	**12**	3,338	1,418	**4,756**	579,063	245,953	**825,016**	173	5	.....	**5**	2	7
Georgia [1]													
Michigan	**29**	7,215	3,417	**10,632**	1,552,247	719,460	**2,271,707**	214	23	2	**25**	19	43
Minnesota	**39**	4,366	6,973	**11,339**	915,844	1,821,525	**2,737,369**	241	7	16	**23**	14	31
Missouri [1]													
New Jersey	**3**	409	237	**646**	27,128	22,211	**49,339**	76	1	.....	**1**	1	6
New Mexico	**3**	200	122	**322**	32,125	16,707	**48,832**	152	.....	.....	.....	.....	.....
New York	**6**	807	269	**1,076**	136,880	52,456	**189,336**	176	7	1	**8**	5	20
Pennsylvania [1]													
Tennessee [1]													
Virginia	**6**	178	66	**244**	34,306	8,326	**42,632**	175	2	.....	**2**	2	1
Wisconsin	**5**	413	130	**543**	78,291	29,342	**107,633**	198	.....	.....	.....	.....	.....
Other States	**19**	575	426	**1,001**	78,726	59,983	**138,709**	139	.....	1	**1**	.....	.....
Total, 1921	**122**	**17,501**	**13,058**	**30,559**	**3,434,610**	**2,975,963**	**6,410,573**	**210**	**45**	**20**	**65**	**43**	**108**
Total, 1920	154	25,627	20,363	**45,990**	7,483,915	6,090,873	**13,574,788**	295	86	20	**106**	60	130

[1] Not segregated.

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TABLE 11.—***IRON MINES:*** *Fatalities and injuries per 1,000 300-day workers.*

State.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers.		
	Underground.	Surface.	**Total.**	Underground.	Surface.	**Total.**	Underground.	Surface.	**Total.**
Alabama	1,930	820	**2,750**	2.59	.....	**1.82**	.....	.....	.....
Georgia [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michigan	5,174	2,398	**7,572**	4.45	0.83	**3.30**	.....	.....	.....
Minnesota	3,053	6,072	**9,125**	2.29	2.64	**2.52**	.....	.....	.....
Missouri [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	91	74	**165**	10.99	.....	**6.06**	.....	.....	.....
New Mexico	107	56	**163**	.....	.....	.....	.....	.....	.....
New York	456	175	**631**	15.35	5.71	**12.68**	.....	.....	.....
Pennsylvania [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Virginia	115	27	**142**	17.39	.....	**14.08**	.....	.....	.....
Wisconsin	261	98	**359**	.....	.....	.....	.....	.....	.....
Other States	262	200	**462**	.....	5.00	**2.16**	.....	.....	.....
Total, 1921	**11,449**	**9,920**	**21,369**	**3.93**	**2.02**	**3.04**	273.04	139.21	**210.91**
Total, 1920	**24,946**	**20,303**	**45,249**	**3.45**	**.99**	**2.34**	269.94	115.16	**200.49**

[1] Not segregated.

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TABLE 12.—***LEAD AND ZINC MINES*** (*Mississippi Valley*): *Men employed, number killed, and days worked, by States, during the year ended December 31, 1921.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	Surface.	**Total.**	Underground.	Surface.	**Total.**		Underground.	Surface.	**Total.**		
Arkansas [1]													
Illinois	6	313	268	**581**	35,440	21,287	**56,727**	98	1		**1**	1	1
Kansas	10	554	122	**676**	106,893	21,303	**128,196**	190	1		**1**		
Missouri	7	2,473	771	**3,244**	759,395	242,868	**1,002,263**	309	8		**8**	5	27
Oklahoma	24	1,476	272	**1,748**	269,788	49,449	**319,237**	183	3		**3**	3	4
Tennessee [1]													
Wisconsin	9	240	79	**319**	27,074	10,518	**37,592**	118	1		**1**		
Other States	10	246	134	**380**	61,309	23,867	**85,176**	224					
Total, 1921	**66**	**5,302**	**1,646**	**6,948**	**1,259,899**	**369,292**	**1,629,191**	**234**	**14**		**14**	**9**	**32**
Total, 1920	119	8,861	2,777	**11,638**	2,466,250	833,028	**3,299,278**	283	33	3	**36**	19	28

[1] Not segregated.

TABLE 13.—***LEAD AND ZINC MINES*** (*Mississippi Valley*): *Fatalities and injuries per 1,000 300-day workers.*

State.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers.		
	Underground.	Surface.	**Total.**	Underground.	Surface.	**Total.**	Underground.	Surface.	**Total.**
Arkansas [1]									
Illinois	118	71	**189**	8.47		**5.29**			
Kansas	357	71	**428**	2.80		**2.34**			
Missouri	2,531	810	**3,341**	3.16		**2.39**			
Oklahoma	899	165	**1,064**	3.34		**2.82**			
Tennessee [1]									
Wisconsin	90	35	**125**	11.11		**8.00**			
Other States	205	79	**284**						
Total, 1921	**4,200**	**1,231**	**5,431**	**3.33**		**2.58**	**446.43**	**151.91**	**379.67**
Total, 1920	8,221	2,777	**10,998**	4.01	1.08	**3.27**	392.04	138.28	**327.97**

[1] Not segregated.

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TABLE 14.—***NONMETALLIC MINERAL MINES:*** *Men employed, number killed, and days worked, by States, during the year ended December 31, 1921.*

State.	Number of active operators reporting.	Number of employees.			Days of labor performed.			Average number of days worked.	Number killed.			Widows.	Orphans.
		Underground.	Surface.	**Total.**	Underground.	Surface.	**Total.**		Underground.	Surface.	**Total.**		
California	21	127	142	**269**	28,740	33,769	**62,509**	232	.....	1	**1**	.....	**2**
Florida	18	.....	3,283	**3,283**	.....	706,017	**706,017**	215	.....	5	**5**	3	**4**
Georgia	7	9	88	**97**	2,390	20,198	**22,588**	233	.....	.....	.....	.....	.....
Iowa	6	262	32	**294**	55,738	6,520	**62,258**	212	1	.....	**1**	.....	.....
Maine	3	.....	32	**32**	.....	6,560	**6,560**	205	.....	.....	.....	.....	.....
Michigan	4	123	80	**203**	31,396	20,520	**51,916**	256	.....	1	**1**	1	**1**
Missouri	8	60	667	**727**	18,780	136,734	**155,514**	214	.....	.....	.....	.....	.....
New York	14	846	445	**1,291**	214,739	105,752	**320,491**	248	3	.....	**3**	2	**7**
North Carolina	9	49	253	**302**	6,105	47,629	**53,734**	178	.....	.....	.....	.....	.....
Ohio	3	180	44	**224**	48,990	11,506	**60,496**	270	3	.....	**3**	.....	.....
Pennsylvania	7	44	78	**122**	11,889	12,826	**24,715**	203	.....	.....	.....	.....	.....
Tennessee	10	129	992	**1,121**	29,550	186,798	**216,348**	193	.....	1	**1**	1	.....
Texas	6	.....	515	**515**	.....	123,074	**123,074**	239	.....	.....	.....	.....	.....
Utah	10	67	67	**134**	16,721	14,416	**31,137**	232	1	.....	**1**	.....	.....
Vermont	4	40	24	**64**	11,120	5,676	**16,796**	262	.....	.....	.....	.....	.....
Virginia	6	132	607	**739**	35,694	177,258	**212,952**	288	.....	.....	.....	.....	.....
Other States	80	562	1,627	**2,189**	130,680	472,455	**603,135**	276	.....	2	**2**	1	**5**
Total, 1921	**216**	**2,630**	**8,976**	**11,606**	**642,532**	**2,087,708**	**2,730,240**	**235**	**8**	**10**	**18**	**8**	**19**
Total, 1920	263	3,149	10,619	**13,768**	888,214	3,062,664	**3,950,878**	287	8	30	**38**	18	**24**

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28171—23——3

TABLE 15.—*NONMETALLIC MINERAL MINES: Fatalities and injuries per 1,000 300-day workers.*

State.	Number of 300-day workers.			Killed per 1,000 300-day workers.			Injured per 1,000 300-day workers.		
	Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface.	Total.
California	96	112	208	.....	8.93	4.81	.....	.....	.....
Florida	.....	2,354	2,354	.....	2.12	2.12	.....	.....	.....
Georgia	8	67	75	.....	.....	.....	.....	.....	.....
Iowa	186	22	208	5.38	.....	4.81	.....	.....	.....
Maine	.....	22	22	.....	.....	.....	.....	.....	.....
Michigan	105	68	173	.....	14.71	5.78	.....	.....	.....
Missouri	62	456	518	.....	.....	.....	.....	.....	.....
New York	716	352	1,068	4.19	.....	2.81	.....	.....	.....
North Carolina	20	159	179	.....	.....	.....	.....	.....	.....
Ohio	163	38	201	18.40	.....	14.93	.....	.....	.....
Pennsylvania	40	43	83	.....	.....	.....	.....	.....	.....
Tennessee	98	623	721	.....	1.61	1.39	.....	.....	.....
Texas	.....	410	410	.....	.....	.....	.....	.....	.....
Utah	56	48	104	17.86	.....	9.62	.....	.....	.....
Vermont	37	19	56	.....	.....	.....	.....	.....	.....
Virginia	119	591	710	.....	.....	.....	.....	.....	.....
Other States	436	1,575	2,011	.....	1.27	.99	.....	.....	.....
Total, 1921	**2,142**	**6,959**	**9,101**	**3.73**	**1.44**	**1.98**	**292.72**	**191.69**	**215.47**
Total, 1920	2,961	10,209	13,170	2.70	2.94	2.89	192.84	152.90	161.88

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TABLE 16.—***FATALITIES:*** *By kinds of mines, causes,*

COPPER MINES.

State.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Alaska				1		1				
Arizona	8			6			1			
California										
Idaho										
Michigan	10			1		1				
Montana	2			1	1	1				
Nevada										
New Mexico										
Oregon										
Utah	1									
Washington										
Other States	1					1				
Total, 1921	**22**			**9**	**1**	**4**	**1**			
Total, 1920	**47**	**2**	**1**	**14**	**7**	**7**	**2**		2	

GOLD, SILVER, AND MISCELLANEOUS METAL MINES.

Alaska				1	1	1				
Arizona	2			1		1				
California	6									
Colorado	5			1	1	1	1			
Georgia										
Idaho	1		1	1	1	2	2			
Montana	1			1						
Nevada	1			1		1			1	
New Mexico										
New York [1]										
North Carolina [1]										
Oregon							1			
South Dakota										
Tennessee [1]										
Utah	2									
Virginia [1]										
Washington										
Wyoming										
Other States	3									
Total, 1921	**21**		**1**	**6**	**3**	**6**	**4**		**1**	
Total, 1920	**33**	**2**		**18**	**3**	**9**	**1**	**1**	**5**	1

[1] Not segregated.

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and States, during the year ended December 31, 1921.

COPPER MINES.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total, underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
					2							
					15		2					2
					12	3				1		4
				2	7					1		1
					1					2		2
					2	1						1
				2	39	4	2			4		10
	2			6	90	6	3			6	2	17

GOLD, SILVER, AND MISCELLANEOUS METAL MINES.

					3	1	1					2
					4	1						1
				3	9	4				1		5
	4				13		1				1	2
					8							
					2	1	1					2
					4	2				1		3
						1						1
					1							
				1	3							
					3							
	4			4	50	10	3			2	1	16
	4			4	81	8		1		8	2	19

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TABLE 16.—***FATALITIES:*** *By kinds of mines, causes,*

COPPER MINES.

State.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Alaska	2								1	3
Arizona										
California										
Idaho										
Michigan									1	1
Montana									1	1
Nevada										
New Mexico										
Oregon										
Utah							1			1
Washington										
Other States										
Total, 1921	**2**						**1**		**3**	**6**
Total, 1920		1					1		4	6

GOLD, SILVER, AND MISCELLANEOUS METAL MINES.

Alaska	1								2	3
Arizona								1		1
California				1					1	2
Colorado										
Georgia										
Idaho	1									1
Montana										
Nevada									1	1
New Mexico										
New York [1]										
North Carolina [1]										
Oregon									1	1
South Dakota				1						1
Tennessee [1]										
Utah				2						2
Virginia [1]										
Washington										
Wyoming										
Other States										
Total, 1921	**2**			**4**				**1**	**5**	**12**
Total, 1920	2						1	4	8	15

[1] Not segregated.

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and States, during the year ended December 31, 1921—Continued.

COPPER MINES.

Open pit.												Grand total.	
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.		
31	32	33	34	35	36	37	38	39	40	41		1921	1920
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17	45
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17	22
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	33
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	8
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	4
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55	.....
.....	6	7	1	.....	.....	.....	.....	.....	.....	1	15	.....	128

GOLD, SILVER, AND MISCELLANEOUS METAL MINES.

.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	5
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	7
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	19
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	22
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	9
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	5
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	19
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78	.....
.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	2	.....	117

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TABLE 16.—***FATALITIES:*** *By kinds of mines, causes, and*

IRON MINES.

State.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Alabama	1				4					
Georgia [1]										
Michigan	6	1		1	1	2				
Minnesota	2	1		1					1	
Missouri [1]										
New Jersey	1									
New Mexico										
New York				1						
Pennsylvania [1]										
Tennessee [1]										
Virginia	1									
Wisconsin										
Other States										
Total, 1921	**11**	**2**		**3**	**5**	**2**			**1**	
Total, 1920	42	4	2	7	12	2	3	1	1	

LEAD AND ZINC MINES.

Arkansas [1]										
Illinois				1						
Kansas										
Missouri	6					1				
Oklahoma	2			1						
Tennessee [1]										
Wisconsin	1									
Other States										
Total, 1921	**9**			**2**		**1**				
Total, 1920	13	1		3	6				1	

NONMETALLIC MINERAL MINES.

All States, 1921	**5**									
All States, 1920	3			2	1			1		

[1] Not segregated.

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States, during the year ended December 31, 1921—Continued.

IRON MINES.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total, underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
					5							
	1			2	14	4				5		9
					5	1	1					2
					1							
					1	1	1			4		6
					1					1		1
	1			2	27	6	2			10		18
				2	76	5	1			4		10

LEAD AND ZINC MINES.

					1							
						1						1
				1	8							
					3							
					1							
	1			1	13	1					1	1
	1			1	26	3	2			1	1	7

NONMETALLIC MINERAL MINES.

				2	7	1						1
					7					1		1

[1] Not segregated.

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TABLE 16.—***FATALITIES:*** *By kinds of mines, causes, and*

IRON MINES.

State.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	**Total, surface.**
	22	23	24	25	26	27	28	29	30	
Alabama										
Georgia [1]										
Michigan						1			1	2
Minnesota	1			1					1	3
Missouri [1]										
New Jersey										
New Mexico										
New York									1	1
Pennsylvania [1]										
Tennessee [1]										
Virginia										
Wisconsin										
Other States										
Total, 1921	1			1		1			3	6
Total, 1920	3	4					2	2	3	14

LEAD AND ZINC MINES.

Arkansas [1]										
Illinois										
Kansas										
Missouri										
Oklahoma										
Tennessee [1]										
Wisconsin										
Other States										
Total, 1921										
Total, 1920				1					2	3

NONMETALLIC MINERAL MINES.

All States, 1921	1	1					1	1		4
All States, 1920		4	1	1			3	3	3	15

[1] Not segregated.

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States, during the year ended December 31, 1921—Continued.

IRON MINES.

Open pit.												Grand total.	
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.		
31	32	33	34	35	36	37	38	39	40	41		1921	1920
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	25
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	27
.....	1	5	4	.....	2	1	.....	.....	.....	.....	13	23	42
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	6
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2
1	1	5	4	.....	2	1	.....	.....	.....	.....	14	65	.....
1	.....	1	2	1	.....	.....	.....	1	.....	.....	6	.....	106

LEAD AND ZINC MINES.

.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	5
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	12
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	4
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	36

NONMETALLIC MINERAL MINES.

3	2	.....	.....	.....	.....	.....	.....	.....	.....	1	6	18	.....
3	6	.....	1	2	.....	.....	.....	1	.....	2	15	.....	38

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TABLE 17.—*ALL MINES: Fatalities and injuries, by causes*

NUMBER KILLED.

Kind of mine.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Copper	22	.....	.....	9	1	4	1	.....	.....	.....
Gold, silver, and miscellaneous metal	21	.....	1	6	3	6	4	.....	1	.....
Iron	11	2	.....	3	5	2	.....	.....	1	.....
Lead and zinc (Mississippi Valley)	9	.....	.....	2	.....	1	.....	.....	.....	.....
Nonmetallic mineral	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, 1921	**68**	**2**	**1**	**20**	**9**	**13**	**5**	.....	**2**	.....
Percentage of grand total killed	29.57	.87	.43	8.70	3.91	5.65	2.17	.....	.87	.....
Percentage of class total killed	50.00	1.47	.73	14.70	6.62	9.56	3.68	.....	1.47	.....
Number killed per 1,000 300-day workers employed underground	1.51	.04	.02	.44	.20	.29	.11	.....	.04	.....

NUMBER INJURED.

Copper	863	678	428	61	521	139	118	200	9	43
Gold, silver, and miscellaneous metal	922	491	511	61	473	220	54	454	12	46
Iron	632	497	501	38	499	98	32	270	23	50
Lead and zinc (Mississippi Valley)	243	457	25	35	267	33	13	185	7	45
Nonmetallic mineral	57	180	22	37	89	11	.....	46	6	13
Total, 1921	**2,717**	**2,303**	**1,487**	**232**	**1,849**	**501**	**217**	**1,155**	**57**	**197**
Percentage of grand total injured	14.60	12.38	7.99	1.25	9.94	2.69	1.17	6.21	.31	1.06
Percentage of class total injured	19.83	16.81	10.86	1.69	13.50	3.66	1.58	8.43	.42	1.44
Number injured per 1,000 300-day workers employed underground	60.11	50.95	32.90	5.13	40.91	11.08	4.80	25.55	1.26	4.36

1911–1920.

Fatalities 1911 to 1920:										
Number (total United States)	1,902	80	47	617	310	417	89	16	131	25
Percentage of grand total	30.49	1.28	.75	9.89	4.97	6.68	1.43	.26	2.10	.40
Injuries 1911 to 1920:										
Number (total United States)	70,739	37,290	30,811	4,465	38,879	9,006	7,528	17,712	687	3,873
Percentage of grand total	19.80	10.44	8.62	1.25	10.88	2.52	2.11	4.96	.19	1.08

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and kinds of mines, during the year ended December 31, 1921.

NUMBER KILLED.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on rail.	Other causes.	Total, underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
.....	.....	.....	.....	2	39	4	2	.....	.....	4	.....	10
.....	4	.....	.....	4	50	10	3	.....	.....	2	1	16
.....	1	.....	.....	2	27	6	2	.....	.....	10	.....	18
.....	.....	.....	.....	1	13	1	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	2	7	1	.....	.....	.....	.....	.....	1
.....	5	.....	.....	11	136	22	7	.....	.....	16	1	46
.....	2.17	.....	.....	4.79	59.13	9.57	3.04	.....	.....	6.96	.43	20.00
.....	3.68	.....	.....	8.09	100.00	47.83	15.22	.....	.....	34.78	2.17	100.00
.....	.11	.....	.....	.25	3.01	.49	.16	.....	.....	.35	.02	1.02

NUMBER INJURED.

.....	1	.....	84	794	3,939	11	42	.....	1	49	31	134
.....	20	.....	157	871	4,292	17	33	.....	.....	51	46	147
.....	4	.....	68	332	3,044	8	13	.....	.....	29	32	82
.....	5	.....	28	477	1,820	1	25	.....	.....	9	20	55
.....	2	.....	6	136	605	15	1	.....	.....	2	4	22
.....	32	.....	343	2,610	13,700	52	114	.....	1	140	133	440
.....	17	.....	1.84	14.03	73.64	.28	.61	.....	.01	.75	.72	2.37
.....	.23	.....	2.50	19.05	100.00	11.82	25.91	.....	.23	31.82	30.22	100.00
.....	.71	.....	7.59	57.75	303.10	1.15	2.52	.....	.02	3.10	2.94	9.73

1911-1920.

247	45	53	4	134	4,117	370	137	24	20	291	106	948
3.96	.72	.85	.06	2.15	65.99	5.93	2.20	.38	.32	4.66	1.70	15.19
242	474	246	4,973	46,369	273,294	838	2,778	101	84	2,624	2,688	9,113
.07	.13	.07	1.39	12.98	76.49	.23	.78	.03	.02	.74	.75	2.55

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TABLE 17.—***ALL MINES:*** *Fatalities and injuries, by causes and*

NUMBER KILLED.

Kind of mine.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Copper	2	.....	.....	.....	.....	.....	1	.....	3	6
Gold, silver, and miscellaneous metal	2	.....	.....	4	.....	.....	.....	1	5	12
Iron	1	.....	.....	1	.....	1	.....	.....	3	6
Lead and zinc (Mississippi Valley)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nonmetallic mineral	1	1	.....	.....	.....	.....	1	1	.....	4
Total, 1921	**6**	**1**	.....	**5**	.....	**1**	**2**	**2**	**11**	**28**
Percentage of grand total killed	2.61	.43	.....	2.17	.....	.43	.87	.87	4.79	12.17
Percentage of class total killed	21.43	3.57	.....	17.86	.....	3.57	7.14	7.14	39.29	100.00
Number killed per 1,000 300-day workers employed on the surface and in the pit	.29	.05	.....	.25	.....	.05	.10	.10	.54	1.38

NUMBER INJURED.

Copper	25	12	8	48	18	67	7	46	264	495
Gold, silver and miscellaneous metal	35	8	8	119	39	146	9	106	407	877
Iron	25	18	19	77	52	110	11	62	256	630
Lead and zinc (Mississippi Valley)	2	3	.....	8	5	10	.....	17	139	184
Nonmetallic mineral	19	42	1	82	139	133	16	70	423	925
Total, 1921	**106**	**83**	**36**	**334**	**253**	**466**	**43**	**301**	**1,489**	**3,111**
Percentage of grand total injured	.57	.45	.19	1.80	1.36	2.50	.23	1.62	8.00	16.72
Percentage of class total injured	3.41	2.67	1.16	10.74	8.13	14.98	1.38	9.67	47.86	100.00
Number injured per 1,000 300-day workers employed on the surface, and in the pit	5.24	4.10	1.78	16.51	12.51	23.04	2.13	14.88	73.62	153.81

1911–1920.

Fatalities, 1911 to 1920: Number (total United States)	55	68	20	64	3	3	52	80	206	551
Percentage of grand total	.88	1.09	.32	1.03	.05	.05	.83	1.28	3.30	8.83
Injuries, 1911 to 1920: Number (total United States)	2,963	1,323	952	4,541	2,600	6,135	431	4,951	19,349	43,245
Percentage of grand total	.83	.37	.27	1.27	.73	1.72	.12	1.38	5.41	12.10

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kinds of mines, during the year ended December 31, 1921—Continued.

NUMBER KILLED.

Open pit.												
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.	Grand Total.
31	32	33	34	35	36	37	38	39	40	41		
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78
1	1	5	4	.....	2	1	.....	.....	.....	.....	14	65
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
3	2	.....	.....	.....	.....	.....	.....	.....	.....	1	6	18
4	3	5	4	.....	2	1	.....	.....	.....	1	20	230
1.74	1.31	2.17	1.74	.....	.87	.43	.....	.....	.....	.43	8.70	100.00
20.00	15.00	25.00	20.00	.....	10.00	5.00	.....	.....	.....	5.00	100.00	.....
.44	.33	.55	.44	.....	.22	.11	.....	.....	.....	.11	2.20	3.09

NUMBER INJURED.

24	3	20	6	19	1	.....	4	.....	22	55	154	4,722
5	.....	4	3	3	.....	1	3	.....	8	9	36	5,352
71	9	93	86	90	7	5	21	.....	86	283	751	4,507
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	3	2,062
43	14	30	10	33	4	.....	28	3	32	212	409	1,961
143	26	147	105	145	12	6	56	3	148	562	1,353	18,604
.77	.14	.79	.56	.78	.06	.03	.30	.02	.80	3.02	7.27	100.00
10.57	1.92	10.86	7.76	10.72	.89	.44	4.14	.22	10.94	41.54	100.00	.....
15.74	2.86	16.18	11.56	15.96	1.32	.66	6.17	.33	16.29	61.86	148.93	249.69

1911–1920.

157	144	164	24	27	8	1	31	20	.....	47	623	6,239
2.52	2.31	2.63	.38	.43	.13	.02	.50	.32	.....	75	9.99	100.00
5,192	1,122	3,668	2,352	2,817	281	138	1,757	88	3,132	11,100	31,647	357,299
1.45	.31	1.03	.66	.79	.08	.04	.49	.02	.88	3.11	8.86	100.00

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TABLE 18.—*ALL MINES: Percentages of fatalities and injuries, by causes and kinds of mines, during the year ended December 31, 1921.*

Causes.	Percentage killed.							Percentage injured.						
	Copper.	Gold, silver, and miscellaneous metal.	Iron.	Lead and zinc (Mississippi Valley).	Nonmetallic mineral.	Total. 1921	Total. 1920	Copper.	Gold, silver, and miscellaneous metal.	Iron.	Lead and zinc (Mississippi Valley).	Nonmetallic mineral.	Total. 1921	Total. 1920
Underground:														
1. Fall of rock or ore from roof or wall	40.00	26.92	16.92	64.29	27.78	29.57	32.47	18.28	17.23	14.02	11.79	2.93	14.60	16.33
2. Rock or ore while loading at working face or chute	.....	.....	3.08	.....	.....	.87	2.11	14.36	9.17	11.03	22.16	9.18	12.38	12.01
3. Timber or hand tools	.....	1.28	.....	.....	.....	.43	.71	9.06	9.55	11.12	1.21	1.12	7.99	8.09
4. Explosives	16.36	7.69	4.61	14.29	.....	8.70	10.35	1.29	1.14	.84	1.70	1.89	1.25	1.25
5. Haulage system (mine cars, mine locomotives, breakage of rope, etc.)	1.82	3.85	7.69	.....	.....	3.91	6.82	11.03	8.84	11.07	12.95	4.54	9.94	10.43
6. Falling down chute, winze, raise, or stope	7.27	7.69	3.08	7.14	.....	5.65	4.24	2.94	4.11	2.17	1.60	.56	2.69	2.11
7. Run of ore from chute or pocket	1.82	5.13	.....	.....	.....	2.17	1.41	2.50	1.01	.71	.63	.....	1.17	1.34
8. Drilling accidents (by machine or hand drills)	.....	.....	.....	.....	.....	.....	.71	4.24	8.48	5.99	8.97	2.34	6.21	5.53
9. Electricity	.....	1.28	1.54	.....	.....	.87	2.11	.19	.22	.51	.34	.30	.31	.20
10. Machinery (other than locomotives or drills)	.....	.....	.....	.....	.....	.....	.24	.91	.86	1.11	2.18	.66	1.06	.98
11. Mine fires	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.02
12. Suffocation from natural gases	.....	5.13	1.54	.....	.....	2.17	1.65	.02	.37	.09	.24	.10	.17	.20
13. Inrush of water	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
14. Nails, splinters, etc	.....	.....	.....	.....	.....	.....	.....	1.78	2.93	1.51	1.36	.30	1.84	1.92
15. Other causes	3.64	5.13	3.08	7.14	11.11	4.79	3.06	16.82	16.28	7.37	23.13	6.93	14.03	13.71
Total underground	**70.91**	**64.10**	**41.54**	**92.86**	**38.89**	**59.13**	**65.88**	**83.42**	**80.19**	**67.54**	**88.26**	**30.85**	**73.64**	**74.12**
Shaft:														
16. Falling down shafts	7.27	12.82	9.23	7.14	5.56	9.57	5.18	.23	.32	.18	.05	.77	.28	.22
17. Objects falling down shafts	3.64	3.85	3.08	.....	.....	3.04	1.41	.89	.62	.29	1.21	.05	.61	.70
18. Breaking of cables	.....	.....	.....	.....	.....	.....	.24	.....	.....	.....	.....	.....	.....	.02
19. Overwinding	.....	.....	.....	.....	.....	.....	.....	.02	.....	.....	.....	.....	.01	.03
20. Skip, cage, or bucket	7.27	2.56	15.38	.....	.....	6.96	4.71	1.04	.95	.64	.44	.10	.75	.77
21. Other causes	.....	1.28	.....	.....	.....	.43	1.17	.66	.86	.71	.97	.20	.72	.75
Total shaft	**18.18**	**20.51**	**27.69**	**7.14**	**5.56**	**20.00**	**12.71**	**2.84**	**2.75**	**1.82**	**2.67**	**1.12**	**2.37**	**2.49**
Surface (at surface yards and shops):														
22. Mine cars or mine locomotives, gravity or aerial trams	3.64	2.56	1.54	.....	5.56	2.61	1.17	.53	.65	.56	.10	.97	.57	.91
23. Railway cars and locomotives	.....	.....	.....	.....	5.56	.43	2.11	.25	.15	.40	.15	2.14	.45	.51
24. Run or fall of ore in or from ore bins	.....	.....	.....	.....	.....	.....	.24	.17	.15	.42	.....	.05	.19	.24
25. Falls of persons	.....	5.13	1.54	.....	.....	2.17	.47	1.02	2.22	1.71	.39	4.18	1.80	1.62
26. Nails, splinters, etc	.....	.....	.....	.....	.....	.....	.....	.38	.73	1.15	.24	7.09	1.36	1.23
27. Hand tools, axes, bars, etc	.....	.....	1.54	.....	.....	.43	.....	1.42	2.73	2.44	.48	6.78	2.50	2.13

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28. Electricity	1.82				5.56	.87	1.65	.15	.17	.24		.82	.23	.16
29. Machinery		1.28			5.56	.87	2.11	.97	1.98	1.38	.82	3.57	1.62	1.72
30. Other causes	5.45	6.41	4.61			4.79	4.71	5.59	7.61	5.68	6.74	21.57	8.00	6.97
Total surface	**10.91**	**15.39**	**9.23**		**22.22**	**12.17**	**12.47**	**10.48**	**16.39**	**13.98**	**8.92**	**47.17**	**16.72**	**15.49**
Open pit:														
31. Falls or slides of rock or ore			1.54		16.67	1.74	.94	.51	.09	1.57		2.19	.77	.86
32. Explosives			1.54		11.11	1.31	3.06	.06		.20		.72	.14	.28
33. Haulage system (cars, locomotives, etc.)			7.69			2.17	1.88	.42	.07	2.06		1.53	.79	.82
34. Steam shovels			6.15			1.74	1.17	.13	.06	1.91		.51	.56	.68
35. Falls of persons							.71	.40	.06	2.00		1.68	.78	.52
36. Falls of derricks, booms, etc			3.08			.87		.02		.15		.21	.06	.07
37. Run or fall of ore in or from ore bins			1.54			.43			.02	.11			.03	
38. Machinery (other than locomotives or steam shovels)								.08	.06	.47		1.43	.30	.48
39. Electricity							.47					.15	.02	.02
40. Hand tools								.47	.15	1.91		1.63	.80	1.01
41. Other causes					5.56	.43	.71	1.17	.17	6.28	0.15	10.81	3.02	3.16
Total open pit			21.54		33.33	8.70	8.94	3.26	.67	16.66	.15	20.86	7.27	7.90
Grand total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

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TABLE 19.—*ALL MINES: Accidents during the year ended December 31, 1921, by States and nature of injury.*

State.	Killed.	Seriously injured (time lost, more than 14 days).			Slightly injured (time lost, 1 to 14 days).
		Permanent total disability.[1]	Permanent partial disability.[2]	Others.	
Alabama	5	1	9	260	372
Alaska	13	.....	.....	61	157
Arizona	23	1	10	527	1,288
Arkansas	.....	.....	.....	1	15
California	17	.....	3	446	866
Colorado	15	1	6	104	622
Connecticut[3]	.....	.....	.....	.....	.....
Florida	5	.....	2	24	491
Georgia	.....	.....	.....	3	1
Idaho	9	1	12	300	523
Illinois	1	.....	2	3	11
Iowa	1	.....	1	16	34
Kansas	1	.....	4	52	242
Kentucky	.....	.....	.....	32	24
Maine	.....	.....	.....	.....	.....
Maryland	.....	.....	.....	.....	1
Massachusetts	.....	.....	.....	.....	.....
Michigan	43	1	11	988	1,978
Minnesota	23	.....	23	488	1,149
Missouri	8	.....	1	201	674
Montana	13	1	10	178	675
Nevada	8	.....	8	188	374
New Hampshire	.....	.....	.....	.....	.....
New Jersey	3	.....	.....	21	62
New Mexico	2	.....	2	46	137
New York	12	.....	24	144	899
North Carolina	.....	.....	.....	.....	1
Ohio	3	.....	.....	10	55
Oklahoma	3	.....	9	104	586
Oregon	2	.....	1	3	22
Pennsylvania	.....	.....	.....	9	1
South Carolina[3]	.....	.....	.....	.....	.....
South Dakota	1	.....	1	91	561
Tennessee	4	.....	2	92	351
Texas	.....	.....	6	18	249
Utah	10	.....	22	267	860
Vermont	.....	.....	.....	1	6
Virginia	2	.....	2	32	80
Washington	.....	.....	1	4	5
Wisconsin	1	.....	.....	44	81
Wyoming	1	1	1	4	12
Other States	1	.....	.....	55	142
Total	**230**	**7**	**173**	**[4] 4,817**	**13,607**

[1] *Permanent total disability.*—Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis, or other condition permanently incapacitating workman from doing any work of a gainful occupation.

[2] *Permanent partial disability.*—Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligamants are severed, or any other injury known in surgery to be permanent partial disability.

[3] Not segregated.

[4] The 4,817 "Other serious injuries" include 3 cases of total disability and 67 cases of partial disability which have not been segregated.

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TABLE 20.—***ALL MINES:*** *Accidents during the year ended December 31, 1921, by causes and nature of injury.*

State.	Killed.	Seriously injured (time lost, more than 14 days).			Slightly injured (time lost, 1 to 14 days).
		Permanent total disability.[1]	Permanent partial disability.[2]	Others.	
Underground:					
Number killed or injured by—					
1. Fall of rock or ore from roof or wall	68	1	23	777	1,916
2. Rock or ore while loading at working face or chute	2	.....	11	554	1,738
3. Timber or hand tools	1	.....	9	401	1,077
4. Explosives	20	3	11	67	151
5. Haulage (mine cars, mine locomotives, breaking of rope, etc.)	9	.....	19	648	1,182
6. Persons falling down chute, winze, raise, or stope	13	.....	5	203	293
7. Run of ore from chute or pocket	5	.....	.....	57	160
8. Drilling (by machine or hand drills)	.....	.....	9	211	935
9. Electricity	2	.....	.....	15	42
10. Machinery (other than locomotives or drills)	.....	.....	8	57	132
11. Mine fires	.....	.....	.....	.....	.....
12. Suffocation from natural gases	5	.....	.....	6	26
13. Inrush of water	.....	.....	.....	.....	.....
14. Nails and splinters	.....	1	.....	61	281
15. Other causes	11	.....	13	614	1,983
Total number killed or injured underground	**136**	**5**	**108**	**3,671**	**9,916**
Shaft:					
Number killed or injured by—					
16. Falling down shaft	22	.....	1	21	30
17. Objects falling down shaft	7	.....	3	33	78
18. Breaking of cables	.....	.....	.....	.....	.....
19. Overwinding	.....	.....	.....	1	.....
20. Cage, skip, or bucket	16	.....	3	65	72
21. Other causes	1	.....	3	43	87
Total number killed or injured by shaft accidents	**46**	.....	**10**	**163**	**267**
Surface:					
Number killed or injured by—					
22. Mine cars or mine locomotives, gravity, or aerial trams	6	.....	2	32	72
23. Railway cars and locomotives	1	.....	2	16	65
24. Run or fall of ore in or from ore bins	.....	.....	1	4	31
25. Falls of persons	5	.....	5	106	223
26. Nails and splinters	.....	.....	2	20	231
27. Hand tools, axes, bars, etc	1	.....	6	82	378
28. Electricity	2	.....	.....	6	37
29. Machinery	2	.....	13	68	220
30. Other causes	11	.....	7	359	1,123
Total number killed or injured by surface accidents	**28**	.....	**38**	**693**	**2,380**

Number of wives left widows, 112. Number of children under 16 years of age left fatherless, 232.

[1] *Permanent total disability.*—Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis, or other condition permanently incapacitating workman from doing any work of a gainful occupation.

[2] *Permanent partial disability.*—Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

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TABLE 20.—*ALL MINES: Accidents during the year ended December 31, 1921, by causes and nature of injury*—Continued.

State.	Killed.	Seriously injured (time lost, more than 14 days).			Slightly injured (time lost, 1 to 14 days).
		Permanent total disability.	Permanent partial disability.	Others.	
Open pit:					
Number killed or injured in pit by—					
31. Falls or slides of rock or ore	4	.....	3	47	93
32. Explosives	3	2	2	7	15
33. Haulage (mine cars, and locomotives and railway cars, etc.)	5	.....	6	47	94
34. Steam shovels	4	.....	2	31	72
35. Falls of persons	.....	.....	1	31	113
36. Falls of derricks, booms, etc	2	.....	.....	1	11
37. Run or fall of ore in or from ore bins	1	.....	.....	1	5
38. Machinery (other than locomotives or steam shovels)	.....	.....	.....	15	41
39. Electricity	.....	.....	.....	1	2
40. Hand tools	.....	.....	1	20	127
41. Other causes	1	.....	2	89	471
Total number killed or injured by open-pit accidents	**20**	**2**	**17**	**290**	**1,044**
Grand total	**230**	**7**	**173**	[1] **4,817**	**13,607**

[1] Includes 3 permanent total disabilities and 67 permanent partial disabilities not segregated by causes.

ACCIDENT RATES ON A UNIFORM TIME BASIS.

In order to learn the real liability to accident of mine employees, it is necessary to know not only the number of men actually killed or injured but also the number of men working in the mines and how long they were exposed to the hazards of their work. If, for example, a mine employs 100 men for 150 days during a year, it is obvious that the accident rate should be only half as much as it would have been if the mine had been worked 300 days. It would not be correct to compare the accident rates for a given mine that during one year worked only half time and during the other year worked full time without calling attention to the difference in the two periods of operation.

Yet, elementary as this consideration is, so-called comparisons between accident rates for different years are often made without reference to the varying periods during which the men were exposed to the hazards of their work.

When the Bureau of Mines' accident questionnaire for 1921 was being prepared, a question was included to elicit from the operators information as to the number of hours constituting a standard shift for their men. With this information and the total number of shifts worked it is possible to calculate the approximate number of hours of accident-exposure for the mine employees. In this way accident rates based on a uniform number of hours of exposure can be presented, and such rates will more accurately portray mining

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hazards than could be done by rates based either on the number of employees or the number of shifts of varying lengths.

Much of this information for 1921 has been tabulated. When the work is completed, the figures will be made the basis of a special report to be issued at a later date.

ACCIDENTS CLASSIFIED BY MINING METHODS.

Different types of ore bodies require different systems of mining and the occupational hazards to which the miners are exposed vary with the system or methods in use. In order to show the accident hazards for the various methods, special tables have been compiled which are presented in this report. The special tables do not cover all metal mines in the United States, but only those for which the reports received were reasonably complete in all details. They cover 55 per cent of all employees and 63 per cent of all shifts worked underground and in open pits in the United States in 1921; men working in surface shops and yards are not included in these tables.

The figures for 1921 are based on reports from 231 companies employing 37,511 men underground or in open-pit mining. The total shifts worked by these employees was 10,263,561, an average of 274 workdays per man. Table 21 presents a summary of the accident and labor data for 1921 for nine different methods of mining.

Similar figures have been compiled since 1914 and the combined figures for eight years are given in Table 25. For the entire eight-year period the fatality rate of 4.77 per 1,000 full-time workers at mines working the room-and-pillar system is higher than for any other group. The nonfatal injury rate, 352.99, for the room-and-pillar system was, however, exceeded by that for overhand stoping, which was 365.22. As is to be expected, the accident rates for open-pit mines are considerably below those for underground work. Among the various underground systems of mining, the lowest fatality and injury rates were for mines using caving systems.

Operators' reports, grouped by mining methods.

Method of mining.	Number of operators.						
	1915	1916	1917	1918	1919	1920	1921
Room and pillar	52	62	57	92	91	63	55
Overhand stoping:							
(*a*) With stulls	17	22	20	20	28	20	18
(*b*) With square sets, cribs, etc	31	32	31	39	47	32	28
(*c*) With filling	62	21	27	19	22	15	10
(*d*) Shrinkage	28	13	19	17	21	24	15
Underhand stoping	5	5	8	21	19	9	14
Caving methods	50	61	69	60	49	51	33
Open pit, with steam shovel	23	23	32	31	39	22	34
Open pit, without steam shovel	12	7	13	20	27	10	24
Total	280	246	276	319	343	246	231

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TABLE 21.—*Summary of metal-mine accident data, grouped by methods of mining, during the year ended December 31, 1921.*

Method of mining.	Number companies represented.	Number States represented.	Days active.	Total days labor.	Number men employed in mines.	Number 300-day workers.	Number killed.		Number injured.	
							Total.	Per 1,000 300-day workers.	Total.	Per 1,000 300-day workers.
Room and pillar	55	16	254	1,658,193	6,528	5,527	20	3.62	2,001	362.04
Overhand stoping:										
(*a*) With stulls	18	7	309	868,527	2,808	2,895	10	3.45	945	326.42
(*b*) With square sets, cribs, etc	28	5	322	1,674,004	5,205	5,580	16	2.87	1,555	278.67
(*c*) With filling	10	6	319	594,634	1,865	1,982	13	6.56	883	445.51
(*d*) Shrinkage	15	9	314	488,113	1,556	1,627	14	8.60	526	323.29
Underhand stoping	14	10	246	736,483	2,993	2,455	13	5.30	714	290.84
Caving methods	33	8	246	2,326,521	9,463	7,755	22	2.84	2,316	298.65
Open pit with steam shovel	34	11	277	1,621,098	5,849	5,404	14	2.59	768	142.12
Open pit without steam shovel	24	15	238	295,988	1,244	987	4	4.05	217	219.86
Total, 1921	**231**	.....	**274**	**10,263,561**	**37,511**	**34,212**	**126**	**3.68**	**9,925**	**290.10**
Total, 1920	246	.....	309	19,057,185	61,742	63,524	**221**	3.48	**19,540**	307.60
Total, 1919	343	.....	304	18,323,004	60,283	61,007	**253**	4.14	**18,130**	296.84
Total, 1918	319	.....	307	22,838,062	74,510	76,127	**349**	4.58	**24,582**	322.91
Total, 1917	276	.....	304	24,808,172	81,611	82,694	**328**	3.97	**26,340**	318.52
Total, 1916	246	.....	307	21,496,327	69,997	71,653	**291**	4.06	**28,576**	398.82
Total, 1915	280	.....	303	22,842,999	75,365	76,140	**324**	4.25	**27,314**	358.73
Total, 1914	258	.....	292	22,004,824	75,453	73,349	**361**	4.92	**24,306**	331.38

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TABLE 22.—***FATALITIES,*** *classified by principal causes and mining methods, during the years ended December 31, 1921 and 1920.*

Method of mining.	Number killed.																						
	By falls of rock.			By run or fall of ore while loading at chute, bin, or working face.			By explosives.			By haulage.			By falls of persons.			Miscellaneous.			In shaft.			Total.	
	1 and 31.[1]			2, 7, and 37.			4 and 32.			5 and 33.			6 and 35.			3, 8, 9, 10, 11, 12, 13, 14, 15, 34, 36, 38, 39, 40, and 41.			16, 17, 18, 19, 20, and 21.				
	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	**Number.**	Rate per 1,000 300-day workers.
1921.																							
Room and pillar	13	65.00	2.36	....	.....	.....	....	.....	.....	1	5.00	0.18	1	5.00	0.18	3	15.00	0.54	2	10.00	0.36	**20**	3.62
Overhand stoping:																							
(*a*) With stulls	5	50.00	1.73	....	.....	.....	2	20.00	0.69	1	10.00	.35	....	.....	.....	....	.....	.....	2	20.00	.69	**10**	3.46
(*b*) With square sets, cribs, etc	5	31.25	.89	1	6.25	0.18	3	18.75	.54	1	6.25	.18	1	6.25	.18	3	18.75	.54	2	12.50	.36	**16**	2.87
(*c*) With filling	6	46.15	3.03	....	.....	.....	2	15.39	1.01	2	15.39	1.01	....	.....	.....	....	.....	.....	3	23.07	1.51	**13**	6.56
(*d*) Shrinkage	5	35.71	3.07	....	.....	.....	2	14.29	1.23	....	.....	.....	3	21.43	1.84	1	7.14	.62	3	21.43	1.84	**14**	8.60
Underhand stoping	4	30.77	1.63	....	.....	.....	....	.....	.....	3	23.08	1.22	2	15.38	.82	....	.....	.....	4	30.77	1.63	**13**	5.30
Caving methods	8	36.36	1.03	2	9.09	.26	3	13.63	.39	1	4.55	.13	1	4.55	.13	2	9.09	.26	5	22.73	.64	**22**	2.84
Open pit, with steam shovel	....	.....	.....	1	7.14	.18	1	7.14	.18	5	35.72	.93	....	.....	.....	7	50.00	1.30	....	.....	.....	**14**	2.59
Open pit, without steam shovel	3	75.00	3.04	....	.....	.....	1	25.00	1.01	....	.....	.....	....	.....	.....	....	.....	.....	....	.....	.....	**4**	4.05
Total, 1921	**49**	**38.89**	**1.43**	**4**	**3.17**	**.12**	**14**	**11.11**	**.41**	**14**	**11.11**	**.41**	**8**	**6.35**	**.23**	**16**	**12.70**	**.47**	**21**	**16.67**	**.61**	**126**	**3.68**
1920.																							
Room and pillar	17	37.78	1.61	4	8.89	.38	3	6.67	.28	12	26.66	1.14	....	.....	.....	3	6.67	.28	6	13.33	.57	**45**	4.26
Overhand stoping:																							
(*a*) With stulls	2	18.18	.78	1	9.09	.39	1	9.09	.39	1	9.09	.39	1	9.09	.39	1	9.09	.39	4	36.37	1.56	**11**	4.29
(*b*) With square sets, cribs, etc	23	46.00	1.81	1	2.00	.08	4	8.00	.32	3	6.00	.24	5	10.00	.39	9	18.00	.71	5	10.00	.39	**50**	3.94
(*c*) With filling	12	63.16	3.98	....	.....	.....	1	5.26	.33	1	5.26	.33	....	.....	.....	....	.....	.....	5	26.32	1.66	**19**	6.30
(*d*) Shrinkage	4	36.37	1.54	....	.....	.....	2	18.18	.77	1	9.09	.38	1	9.09	.38	1	9.09	.38	2	18.18	.77	**11**	4.22
Underhand stoping	2	15.38	.52	....	.....	.....	4	30.77	1.03	3	23.08	.77	2	15.38	.52	1	7.69	.25	1	7.69	.25	**13**	3.34
Caving methods	29	52.73	1.60	5	9.09	.27	4	7.27	.22	4	7.27	.22	....	.....	.....	8	14.55	.44	5	9.09	.27	**55**	3.02
Open pit, with steam shovel	....	.....	.....	....	.....	.....	6	37.50	.65	3	18.75	.33	1	6.25	.11	6	37.50	.65	....	.....	.....	**16**	1.74
Open pit, without steam shovel	1	100.00	1.27	....	.....	.....	....	.....	.....	....	.....	.....	....	.....	.....	....	.....	.....	....	.....	.....	**1**	1.27
Total, 1920	**90**	**40.72**	**1.42**	**11**	**4.98**	**.17**	**25**	**11.31**	**.39**	**28**	**12.67**	**.44**	**10**	**4.53**	**.16**	**29**	**13.12**	**.46**	**28**	**12.67**	**.44**	**221**	**3.48**

[1] Numbers refer to causes as shown on Table 24 and other similar tables.

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TABLE 23.—***INJURIES,*** *classified by principal causes and mining methods, during the years ended December 31, 1921 and 1920.*

Method of mining.	Number injured.																							
	By falls of rock.			By run or fall of ore while loading at chute, bin, or working face.			By explosives.			By haulage.			By falls of persons.			Miscellaneous.			In shaft.			Total.	
	1 and 31.[1]			2, 7, and 37.			4 and 32.			5 and 33.			6 and 35.			3,, 8, 9, 10, 11, 12, 13, 14, 15, 34, 36, 38, 39, 40, and 41.			16, 17, 18, 19, 20, and 21.				
	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Per cent of total.	Rate per 1,000 300-day workers.	Number.	Rate per 1,000 300-day workers.
1921.																								
Room and pillar	238	11.89	43.06	542	27.09	98.07	66	3.30	11.94	381	19.04	68.93	33	1.65	5.97	681	34.03	123.21	60	3.00	10.86	**2,001**	362.04
Overhand stoping:																								
(*a*) With stulls	176	18.62	60.79	143	15.13	49.40	5	.53	1.73	130	13.76	44.91	57	6.03	19.69	400	42.33	138.17	34	3.60	11.74	**945**	326.43
(*b*) With square sets, cribs, etc	384	24.69	68.82	159	10.23	28.49	9	.58	1.61	193	12.41	34.59	43	2.77	7.71	720	46.30	129.03	47	3.02	8.42	**1,555**	278.67
(*c*) With filling	137	15.51	69.12	270	30.58	136.23	6	.68	3.03	95	10.76	47.93	14	1.58	7.06	319	36.13	160.95	42	4.76	21.19	**883**	445.51
(*d*) Shrinkage	76	14.45	46.71	154	29.28	94.65	11	2.09	6.76	62	11.79	38.11	17	3.23	10.45	191	36.31	117.39	15	2.85	9.22	**526**	323.29
Underhand stoping	84	11.76	34.22	211	29.55	85.95	4	.56	1.63	116	16.25	47.25	19	2.66	7.74	271	37.96	110.39	9	1.26	3.66	**714**	290.84
Caving methods	607	26.21	78.27	303	13.08	39.07	41	1.77	5.29	310	13.39	39.98	112	4.83	14.44	896	38.69	115.54	47	2.03	6.06	**2,316**	298.65
Open pit, with steam shovel	65	8.46	12.03	4	.52	.74	7	.91	1.30	110	14.32	20.36	84	10.94	15.54	498	64.85	92.15	.....	.....	.....	**768**	142.12
Open pit, without steam shovel	27	12.44	27.35	.....	.....	.....	6	2.77	6.08	14	6.45	14.19	14	6.45	14.19	156	71.89	158.05	.....	.....	.....	**217**	219.86
Total, 1921	**1,794**	**18.08**	**52.44**	**1,786**	**17.99**	**52.20**	**155**	**1.56**	**4.53**	**1,411**	**14.22**	**41.24**	**393**	**3.96**	**11.49**	**4,132**	**41.63**	**120.78**	**254**	**2.56**	**7.42**	**9,925**	**290.10**

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1920.	324	9.89	30.69	873	26.63	32.69	68	2.07	6.44	651	19.86	61.67	43	1.31	4.07	1,174	35.82	111.21	145	4.42	13.73	3,278	310.50
Room and pillar	159	19.18	62.06	170	20.51	66.36	9	1.08	3.51	102	12.30	39.81	59	7.12	23.03	318	38.36	124.12	12	1.45	4.63	829	323.57
Overhand stoping:																							
(a) With stulls	1,236	24.98	97.37	573	11.58	45.14	43	.87	3.39	629	12.71	49.55	166	3.36	13.08	2,181	44.09	171.81	119	2.41	9.37	4,947	389.71
(b) With square sets, cribs, etc	205	25.28	67.95	187	23.06	61.98	4	.49	1.32	102	12.58	33.81	12	1.48	3.98	262	32.30	86.84	39	4.81	12.93	811	208.81
(c) With filling	85	12.41	32.65	198	28.91	76.07	21	3.07	8.07	79	11.53	30.35	17	2.48	6.53	266	38.83	102.19	19	2.77	7.30	685	263.16
(d) Shrinkage	121	8.69	31.06	528	37.93	135.56	7	.50	1.80	273	19.61	70.09	32	2.30	8.21	421	30.25	108.09	10	.72	2.57	1,392	357.38
Underhand stoping	1,769	28.82	97.29	739	12.04	40.64	113	1.84	6.21	777	12.66	42.73	139	2.27	7.65	2,456	40.01	135.07	145	2.36	7.98	6,138	337.57
Caving methods	143	10.39	15.50	.....	.....	.....	27	1.96	2.93	128	9.30	13.87	93	6.76	10.08	985	71.59	106.75	.....	.....	.....	1,376	149.13
Open pit, with steam shovel	18	21.43	22.90	.....	.....	.....	3	3.57	3.82	7	8.33	8.90	3	3.57	3.82	53	63.10	67.43	.....	.....	.....	84	106.87
Open pit, without steam shovel																							
Total, 1920	4,060	20.78	63.91	3,268	16.72	51.45	295	1.51	4.64	2,748	14.06	43.26	564	2.89	8.88	8,116	41.54	127.76	469	2.50	7.70	19,540	307.60

[1] Numbers refer to causes as shown on Table 24 and other similar tables.

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TABLE 24.—*Metal-mine accidents in 1921, by*

NUMBER KILLED.

State.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Room and pillar	13	.....	1	.....	1	1	.....	.....	.....	.....
Overhand stoping:										
(*a*) With stulls	5	.....	.....	2	1	.....	.....	.....	.....	.....
(*b*) With square sets, cribs, etc	5	.....	1	3	1	1	1	.....	.....	.....
(*c*) With filling	6	.....	.....	2	.....	2	.....	.....	.....	.....
(*d*) Shrinkage	5	.....	.....	2	.....	3	.....	.....	.....	.....
Underhand stoping	4	.....	.....	.....	3	2	.....	.....	.....	.....
Caving methods	8	2	.....	3	1	1	.....	.....	1	.....
Open pit, with steam shovel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Open pit, without steam shovel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, 1921	**46**	**2**	**2**	**12**	**7**	**10**	**1**	.....	**1**	.....
Total, 1920	89	6	3	19	25	9	5	1	6	1

NUMBER INJURED.

Room and pillar	238	534	46	66	381	33	8	158	13	19
Overhand stoping:										
(*a*) With stulls	176	119	84	5	130	57	24	56	1	13
(*b*) With square sets, cribs, etc	384	155	215	9	193	43	4	74	8	16
(*c*) With filling	137	232	77	6	95	14	38	52	3	9
(*d*) Shrinkage	76	140	48	11	62	17	14	71	4	7
Underhand stoping	84	202	43	4	116	19	9	89	4	16
Caving methods	607	256	478	41	310	112	47	124	15	13
Open pit, with steam shovel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Open pit, without steam shovel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, 1921	**1,702**	**1,638**	**991**	**142**	**1,287**	**295**	**144**	**624**	**48**	**93**
Total, 1920	3,899	2,946	2,051	265	2,613	468	322	1,186	58	223

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causes, grouped by ***MINING METHODS.***

NUMBER KILLED.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total, underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
.....	.....	.....	.....	2	18	2	.....	.....	.....	.....	.....	2
.....	.....	.....	.....	.....	8	1	.....	.....	.....	1	.....	2
.....	.....	.....	.....	2	14	.....	1	.....	.....	1	.....	2
.....	.....	.....	.....	.....	10	3	.....	.....	.....	.....	.....	3
.....	.....	.....	.....	1	11	3	.....	.....	.....	.....	.....	3
.....	.....	.....	.....	.....	9	.....	.....	.....	.....	4	.....	4
.....	.....	.....	.....	1	17	3	.....	.....	.....	2	.....	5
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	6	87	12	1	.....	.....	8	.....	21
.....	1	.....	.....	11	176	9	4	.....	.....	12	3	28

NUMBER INJURED.

.....	4	.....	18	423	1,941	17	16	.....	.....	12	15	60
.....	11	.....	21	214	911	3	6	.....	.....	22	3	34
.....	.....	.....	71	336	1,508	2	12	.....	.....	21	12	47
.....	.....	.....	12	166	841	5	25	.....	.....	6	6	42
.....	.....	.....	11	50	511	.....	5	.....	1	4	5	15
.....	.....	.....	5	114	705	.....	3	.....	.....	3	3	9
.....	3	.....	56	207	2,269	4	7	.....	.....	14	22	47
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	18	.....	194	1,510	8,686	31	74	.....	1	82	66	254
3	50	2	436	3,069	17,591	44	118	4	3	157	163	489

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TABLE 24.—*Metal-mine accidents in 1921, by*

NUMBER KILLED.

State.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Room and pillar										
Overhand stoping:										
(*a*) With stulls										
(*b*) With square sets, cribs, etc										
(*c*) With filling										
(*d*) Skrinkage										
Underhand stoping										
Caving methods										
Open pit, with steam shovel										
Open pit, without steam shovel										
Total, 1921										
Total, 1920										

NUMBER INJURED.

Room and pillar										
Overhand stoping:										
(*a*) With stulls										
(*b*) With square sets, cribs, etc										
(*c*) With filling										
(*d*) Shrinkage										
Underhand stoping										
Caving methods										
Open pit, with steam shovel										
Open pit, without steam shovel										
Total, 1921										
Total, 1920										

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causes, grouped by ***MINING METHODS***—Continued.

NUMBER KILLED.

Open pit.												Grand total.	
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.		
31	32	33	34	35	36	37	38	39	40	41		1921	1920
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	45
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	50
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	19
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	13
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22	55
.....	1	3	4	.....	2	1	.....	.....	.....	1	14	14	16
3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	4	1
3	2	5	4	.....	2	1	.....	.....	.....	1	18	126	.....
1	6	3	4	1	.....	.....	.....	1	.....	1	17	.....	221

NUMBER INJURED.

.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,001	3,278
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	945	829
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,555	4,947
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	883	811
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	526	685
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	714	1,392
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,316	6,138
65	7	110	75	84	7	4	25	.....	87	304	768	768	1,376
27	6	14	2	14	1	.....	15	1	21	116	217	217	84
92	13	124	77	98	8	4	40	1	108	420	985	9,925	.....
161	30	135	153	96	11	.....	51	2	188	633	1,460	.....	19,540

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TABLE 25.—*Accidents compared by mining methods and causes for the* ***eight-year period*** *1914 to 1921, inclusive.*

	Room and pillar.		Overhand stoping.		Underhand stoping.		Caving methods.		Open pit.			
									Steam shovel.		Without steam shovel.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Nonfatal injuries:												
Falls of rock (roof or bank)	3,398	13.79	20,386	24.65	797	8.68	13,795	29.61	2,354	16.33	264	22.18
Run or fall of rock or ore while loading	6,075	24.65	14,962	18.09	2,645	28.82	5,296	11.37	45	.31	7	.59
Explosives	424	1.72	898	1.09	323	3.52	796	1.71	377	2.62	50	4.20
Haulage	4,919	19.96	10,384	12.55	1,981	21.58	5,935	12.74	1,760	12.21	153	12.86
Falls of persons	408	1.66	2,704	3.27	204	2.22	1,139	2.45	1,206	8.37	81	6.81
Miscellaneous	8,296	33.67	31,157	37.67	3,123	34.02	18,390	39.48	8,671	60.16	635	53.36
Shaft	1,120	4.55	2,217	2.68	106	1.16	1,232	2.64	.....	.....	.....	.....
Total nonfatal injuries	**24,640**	**100.00**	**82,708**	**100.00**	**9,179**	**100.00**	**46,583**	**100.00**	**14,413**	**100.00**	**1,190**	**100.00**
Fatalities:												
Falls of rock (roof or bank)	156	46.85	418	40.86	42	36.21	261	45.69	38	20.21	14	60.86
Run or fall of rock or ore while loading	6	1.80	39	3.81	6	5.17	24	4.21	1	.53	.....	.....
Explosives	51	15.32	92	8.99	14	12.07	53	9.29	37	19.68	4	17.39
Haulage	42	12.61	51	4.99	21	18.10	49	8.58	74	39.36	2	8.70
Falls of persons	8	2.40	89	8.70	5	4.31	37	6.48	4	2.13	2	8.70
Miscellaneous	17	5.10	113	11.05	6	5.17	58	10.16	34	18.09	1	4.35
Shaft	53	15.92	221	21.60	22	18.97	89	15.59	.....	.....	.....	.....
Total fatalities	**333**	**100.00**	**1,023**	**100.00**	**116**	**100.00**	**571**	**100.00**	**188**	**100.00**	**23**	**100.00**
Number of 300-day workers	69,803		226,461		26,964		139,804		68,659		9,085	
Nonfatal accident rate per 1,000 300-day workers	352.99		365.22		340.42		333.20		209.92		130.99	
Fatality rate per 1,000 300-day workers	4.77		4.52		4.30		4.08		2.74		2.53	

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ROOM-AND-PILLAR SYSTEM.

The room-and-pillar system of mining is peculiarly adapted to ore deposits that lie flat or nearly flat. The accident data for mines using this system in 1921 are based upon the reports of 55 companies employing 6,528 men underground; the employees worked 1,658,193 shifts, an average of 254 work-days per man. Accidents resulted in 20 deaths and 2,001 nonfatal injuries among the workmen, representing a fatality rate of 3.62 per thousand employees (300-day basis) and an injury rate of 362.04 as compared with a fatality rate of 4.26 and an injury rate of 310.50 in 1920. The main cause of the nonfatal accidents was the falling or running of ore while loading at chute, bin, or working face, and was responsible for 27 per cent of the injuries. Next in order were haulage accidents, which were responsible for 19 per cent of the injuries, followed by falls of rock from roof or wall which caused 12 per cent of the injuries. The injury rate of 362.04 per thousand employees for the room-and-pillar method was higher in 1921 than the rate for any other mining method except overhand stoping with filling, for which the rate was 445.51.

Number killed and injured in mines using ***room-and-pillar*** *method of mining during the calendar years 1915 to 1921.*

Cause.	Killed.							Injured.						
	1915	1916	1917	1918	1919	1920	1921	1915	1916	1917	1918	1919	1920	1921
Fall of rock	17	21	33	10	23	17	13	401	591	402	430	547	324	238
Run or fall of rock or ore in loading	.....	.....	1	.....	.....	4	.....	746	998	734	749	707	873	542
Explosives	7	9	7	8	9	3	.....	45	58	31	43	43	68	66
Haulage	.....	7	6	2	6	12	1	429	793	707	544	696	651	381
Falls of persons	1	2	2	.....	.....	.....	1	29	68	88	50	43	43	33
Miscellaneous	.....	2	2	.....	3	3	3	1,045	1,273	858	1,124	1,084	1,174	681
Shaft	2	6	10	18	6	6	2	124	232	133	211	134	145	60
Total	27	47	61	38	47	45	20	2,819	4,013	2,953	3,151	3,254	3,278	2,001
Per 1,000 300-day workers	3.97	5.59	6.00	4.11	4.38	4.26	3.62	413.95	477.17	290.68	341.20	303.26	310.50	362.04

OVERHAND STOPING.

Accident reports for mines using overhand stoping methods were received from 71 companies employing 11,434 men underground; the men averaged 317 workdays during 1921. Fifty-three fatalities and 3,909 injuries among the underground workers resulted in a fatality rate of 4.39 per thousand men employed (300-day basis) and an injury rate of 323.49, as compared with rates of 4.36 killed and 348.34 injured in 1920. The combined fatality rate for overhand stoping was exceeded only by the rate for underhand stoping, which was 5.30; the nonfatal injury rate was exceeded by that for the room-and-pillar method, which was 362.04.

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Of the different types of overhand stoping, shrinkage showed the highest fatality rate, 8.60 per thousand employees, followed by a rate of 6.56 for mines where filling methods are used. The highest injury rate was 445.51 per thousand employees, for mines using overhand stoping with filling. At mines where stulls were used and also at mines using square sets, cribs, etc., falls of rock or ore from roof or wall were the principal cause of nonfatal injuries. At mines using shrinkage and filling methods, the largest single cause of accidents was the falling or running of the ore while the men were loading at chutes, bins, or working face.

Number killed and injured in mines where ***overhand stoping*** *was principal method used during the calendar years 1915 to 1921.*

Cause.	Killed.							Injured.						
	1915	1916	1917	1918	1919	1920	1921	1915	1916	1917	1918	1919	1920	1921
Fall of rock	89	51	48	51	40	41	21	3,579	3,431	3,370	2,784	1,704	1,685	773
Run or fall of rock or ore in loading	10	5	5	9	4	2	1	2,922	2,717	2,325	1,630	994	1,128	726
Explosives	16	10	15	12	5	8	9	134	204	161	91	75	77	31
Haulage	9	6	4	6	8	6	4	1,771	1,604	1,798	1,443	832	912	480
Falls of persons	21	5	12	6	9	7	4	519	354	347	376	167	254	131
Miscellaneous	13	16	17	33	11	11	4	6,391	4,525	4,688	4,051	2,568	3,027	1,630
Shaft	35	32	33	31	21	16	10	352	363	377	285	223	189	138
Total	193	125	134	148	98	91	53	15,668	13,198	13,066	10,660	6,563	7,272	3,909
Per 1,000 300-day workers	4.71	4.13	3.67	5.00	4.71	4.36	4.39	382.72	436.44	358.23	360.27	315.30	348.34	323.49

UNDERHAND STOPING.

The figures for the underhand stoping system of mining are compiled from the reports of 14 companies employing 2,993 men underground for an average of 246 days per man. Accidents killed 13 men and injured 714, making the fatality rate 5.30 per 1,000 employees and the injury rate 290.84, as compared with a fatality rate of 3.34 and an injury rate of 357.38 in the preceding year. The fatality rate in 1921 was higher than that for any other system of mining except that for the shrinkage and filling methods of overhand stoping. The injury rate was lower than for other methods of underground operations except overhand stoping with square sets, cribs, etc. The main cause of accidents in underhand stoping work was run or fall of ore while loading at face, chutes, or bins.

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Number killed and injured in mines where ***underhand stoping*** *was principal method used during the calendar years 1915 to 1921.*

Cause.	Killed.							Injured.						
	1915	1916	1917	1918	1919	1920	1921	1915	1916	1917	1918	1919	1920	1921
Fall of rock	7	3	13	6	7	2	4	53	95	77	170	197	121	84
Run or fall of rock or ore in loading	1	1	.....	.....	4	.....	.....	248	524	402	394	338	528	211
Explosives	1	3	1	3	2	4	.....	17	217	9	33	36	7	4
Haulage	1	2	3	3	6	3	3	329	365	395	221	282	273	116
Falls of persons	.....	1	.....	.....	.....	2	2	6	24	21	28	74	32	19
Miscellaneous	.....	1	.....	4	.....	1	.....	312	459	475	551	634	421	271
Shaft	1	1	2	10	3	1	4	11	23	1	44	8	10	9
Total	11	12	19	26	22	13	13	976	1,707	1,380	1,441	1,569	1,392	714
Per 1,000 300-day workers	5.72	3.23	4.10	4.94	4.33	3.34	5.30	507.80	460.11	297.99	273.53	308.74	357.38	290.84

CAVING SYSTEMS.

The figures presented in the following table represent several varieties of the caving system, such as top slicing, substoping, block caving, etc., and the preliminary work that is necessary for any caving system. Accident reports were received from 33 companies at whose mines 9,463 men were employed underground, each man averaging 246 workdays during 1921. Accidents resulted in 22 fatalities and 2,316 injuries, indicating a death rate of 2.84 and an injury rate of 298.65 per 1,000 employees (300-day workers), as compared with a fatality rate of 3.02 and an injury rate of 337.57 in 1920. In 1921 the fatality rate for caving methods was lower than for other systems of underground work, but the injury rate was not quite as low as that for underhand stoping and overhand stoping with square sets. Falls or slides of rock from roof or wall were the chief cause of accidents at mines using caving methods.

Number killed and injured in mines using the ***caving*** *system of mining during the calendar years 1915 to 1921.*

Cause.	Killed.							Injured.						
	1915	1916	1917	1918	1919	1920	1921	1915	1916	1917	1918	1919	1920	1921
Fall of rock	34	34	36	38	40	29	8	1,879	1,962	1,841	1,915	1,777	1,769	607
Run or fall of rock or ore in loading	4	3	3	2	3	5	2	486	889	745	936	600	739	303
Explosives	8	13	6	7	5	4	3	66	173	100	138	86	113	41
Haulage	2	8	13	6	6	4	1	794	978	840	798	657	777	310
Falls of persons	8	7	8	4	3	.....	1	142	124	146	194	139	139	112
Miscellaneous	7	2	3	22	2	8	2	2,267	2,795	2,711	2,658	2,157	2,456	896
Shaft	4	13	16	13	8	5	5	167	213	162	174	124	145	47
Total	67	80	85	92	67	55	22	5,801	7,134	6,545	6,813	5,540	6,138	2,316
Per 1,000 300-day workers	3.79	3.92	4.28	4.69	3.88	3.02	2.84	328.13	349.71	329.84	347.55	320.51	337.57	298.65

OPEN-PIT MINING WITH STEAM SHOVEL.

Open-pit mining with steam shovel is represented by reports from 34 companies operating mines in 11 States and employing 5,849

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men (shop employees excluded), each of whom averaged 277 workdays in 1921. Accidents killed 14 men and injured 768. The fatality rate was 2.59 per 1,000 employees as compared with 1.73 in 1920, and the injury rate was 142.12 as compared with 149.13. Both of these rates were the lowest for any system of mining during 1921. Haulage accidents were responsible for more injuries than any other single cause.

Number killed and injured in ***open-pit*** *mines where the ore was mined by steam shovel during the calendar years 1915 to 1921.*

Cause.	Killed.							Injured.						
	1915	1916	1917	1918	1919	1920	1921	1915	1916	1917	1918	1919	1920	1921
Fall of rock	4	5	9	11	4	.....	.....	449	402	380	346	144	143	65
Run or fall of rock or ore in loading	.....	.....	.....	.....	.....	.....	1	8	9	17	5	2	.....	4
Explosives	1	7	4	9	1	6	1	38	41	75	57	25	27	7
Haulage	16	11	13	13	5	3	5	194	287	304	336	130	128	110
Falls of persons	.....	.....	.....	1	2	1	.....	179	129	223	189	71	93	84
Miscellaneous	3	4	3	5	3	6	7	1,040	1,548	1,288	1,352	704	985	498
Shaft	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	24	27	29	39	15	16	14	1,908	2,416	2,287	2,285	1,076	1,376	768
Per 1,000 300-day workers	3.16	3.15	2.81	3.66	2.48	1.73	2.59	250.79	281.58	221.39	214.27	178.00	149.13	142.12

OPEN-PIT MINING WITHOUT STEAM SHOVEL.

Reports from open-pit mines where steam shovels were not used were received from 24 companies employing 1,244 men. Each man averaged 238 workdays in 1921. Accidents killed 4 men and injured 217, the fatality rate being 4.05 and the injury rate being 219.86, as compared with rates of 1.27 killed and 106.87 injured in 1920. The total period of exposure to mining hazards for this group of workers in 1921 was equivalent to only 295,988 man-days, too small a period to give any significance to the increased rates during 1921. Mines using open-pit methods without steam shovels usually have lower accident rates than those of any other group.

Number killed and injured in ***open-pit*** *mines where no steam shovels were used during the calendar years 1915 to 1921.*

Cause.	Killed.							Injured.						
	1915	1916	1917	1918	1919	1920	1921	1915	1916	1917	1918	1919	1920	1921
Fall of rock	1	.....	.....	2	3	1	3	16	26	24	81	13	18	27
Run or fall of rock or ore in loading	.....	.....	.....	.....	.....	.....	.....	1	3	.....	.....	.....	.....	.....
Explosives	.....	.....	.....	2	1	.....	1	1	5	16	7	7	3	6
Haulage	.....	.....	.....	1	.....	.....	.....	22	34	21	22	5	7	14
Falls of persons	1	.....	.....	1	.....	.....	.....	9	2	2	14	26	3	14
Miscellaneous	1	.....	.....	.....	.....	.....	.....	93	38	46	108	77	53	156
Shaft	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	3	0	0	6	4	1	4	142	108	109	232	128	84	217
Per 1,000 300-day workers	2.54	.....	.....	3.39	3.57	1.27	4.05	120.03	348.39	86.71	131.15	114.28	106.87	219.86

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ACCIDENTS IN MINERAL INDUSTRIES.

Table 26 has been prepared to show the comparative accident rates for 1921 in all branches of the mineral industry for which statistics are compiled by the Bureau of Mines. Reports of nonfatal injuries at coal mines are not received by the Bureau of Mines. For all other branches of the industry, however, the highest injury rate was for the lead and zinc mines in the Mississippi Valley States, and the lowest nonfatal injury rate was for marble quarries. The highest fatality rate was that for coal mines and the lowest fatality rate was that for ore-dressing plants.

Table 27 indicates the percentage of deaths due to each of the chief causes of accidents at coal mines, metal mines, and quarries. During the 11 years covered by the table most of the fatal accidents at coal mines were caused by falls of roof or side, use of haulage equipment, gas and coal-dust explosions, and explosives. At metal mines the main causes of fatalities have been falls of rock or ore, falls of persons, the use of explosives, and haulage equipment. Fatal accidents at quarries were mainly due to haulage equipment, falls or slides of rock or overburden, explosives, and machinery.

TABLE 26.—*Accident rates in different branches of mineral industries in 1921, compared on a 300-day basis (length of shift not considered).*

Branch of mineral industry.	Average days active.	Men employed.		Days of labor performed.	Killed.	Injured.	Number killed or injured per 1,000 300-day workers.	
		Actual number.	Equivalent in 300-day workers (calculated).				Killed.	Injured.
Coal mines	173	823,253	474,743	142,422,769	1,973	(1)	4.16	.....
All metal mines	238	93,929	74,510	22,352,702	230	18,604	3.09	249.68
Copper mines	244	18,300	14,871	4,461,296	55	4,722	3.70	317.53
Gold and miscellaneous metal mines	269	26,516	23,738	7,121,402	78	5,352	3.29	225.46
Iron mines	210	30,559	21,369	6,410,573	65	4,507	3.04	210.91
Lead and zinc mines (Mississippi Valley)	234	6,948	5,431	1,629,191	14	2,062	2.58	379.67
Nonmetallic mineral mines	235	11,606	9,101	2,730,240	18	1,961	1.98	215.47
All quarries (including outside works)	233	77,185	59,958	17,987,547	120	10,465	2.00	174.54
Cement-rock quarries	290	10,815	10,459	3,137,789	20	2,233	1.91	213.50
Granite quarries	222	9,479	7,010	2,102,854	18	940	2.57	134.09
Limestone quarries	223	39,551	29,394	8,819,813	58	5,248	1.97	178.51
Marble quarries	265	4,549	4,025	1,207,467	6	406	1.49	100.87
Sandstone and bluestone quarries	183	3,928	2,394	718,310	3	374	1.25	156.22
Slate quarries	240	3,564	2,848	854,396	4	385	1.40	135.18
Trap-rock quarries	216	5,299	3,823	1,146,918	11	879	2.88	229.92
All quarries (excluding outside works)	220	49,292	36,082	10,824,541	80	6,029	2.22	167.09
All quarries (outside works only)	257	27,893	23,877	7,163,006	40	4,436	1.68	185.79
Metallurgical plants	284	37,465	35,458	10,637,636	27	4,494	.76	126.74
Ore-dressing plants	240	10,047	8,037	2,411,148	4	1,214	.50	151.05
Smelters	307	18,656	19,113	5,733,969	14	2,129	.73	111.39
Auxiliary works	284	8,762	8,308	2,492,519	9	1,151	1.08	138.54
All coke ovens	257	16,204	13,868	4,160,298	17	1,853	1.23	133.62
Beehive coke ovens	141	6,011	2,835	850,543	5	336	1.76	118.52
By-product coke ovens	325	10,193	11,033	3,309,755	12	1,517	1.09	137.50
Total, 1921	**189**	**1,048,036**	**658,537**	**197,560,952**	**2,367**	**[1] 35,416**	**3.59**	**192.19**
Total, 1920	249	1,995,044	908,204	272,460,757	2,984	[1] 56,057	3.29	182.51

[1] Injuries for coal mines not available.

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TABLE 27.—***METAL MINES, COAL MINES, AND QUARRIES:*** *Principal causes of fatalities, showing percentage due to each cause, 1911 to 1921, by years.*

Industry.	Cause of death.								Total.
	Falls of overburden, roof, quarry material, ore, or coal.	Explosives.	Haulage and handling rock, ore, or coal.	Falls of persons.	Electricity.	Machinery.	Gas and dust explosions.	Other causes.	
1911:									
Metal mines	**32.52**	**11.22**	**7.63**	**15.39**	**2.45**	**3.16**	.....	**27.63**	**100.00**
Coal mines	47.40	6.02	17.13	1.28	3.73	1.51	13.74	9.19	100.00
Quarries	25.53	26.60	20.21	8.51	1.07	9.04	.....	9.04	100.00
1912:									
Metal mines	**34.49**	**14.22**	**10.28**	**13.92**	**3.78**	**3.78**	.....	**19.52**	**100.00**
Coal mines	49.03	6.08	19.14	1.36	3.64	1.65	11.99	7.11	100.00
Quarries	17.37	22.06	27.70	8.92	1.87	11.74	.....	10.33	100.00
1913:									
Metal mines	**34.70**	**13.03**	**12.88**	**12.30**	**3.81**	**4.39**	.....	**18.89**	**100.00**
Coal mines	45.39	4.96	18.31	1.80	3.16	1.80	18.45	6.13	100.00
Quarries	14.75	24.04	23.50	9.29	2.73	12.57	.....	13.12	100.00
1914:									
Metal mines	**36.32**	**10.73**	**10.20**	**16.10**	**3.04**	**2.50**	.....	**21.11**	**100.00**
Coal mines	46.09	5.95	18.79	2.85	4.07	1.87	14.22	6.16	100.00
Quarries	29.45	19.44	18.33	12.78	1.67	6.11	.....	12.22	100.00
1915:									
Metal mines	**36.71**	**14.10**	**10.49**	**15.91**	**2.53**	**1.99**	.....	**18.26**	**100.00**
Coal mines	47.55	6.83	18.64	1.37	4.36	1.68	13.40	6.17	100.00
Quarries	30.40	18.92	15.55	11.48	2.03	9.46	.....	12.16	100.00
1916:									
Metal mines	**32.28**	**12.77**	**10.04**	**14.64**	**3.73**	**2.58**	.....	**23.96**	**100.00**
Coal mines	47.84	6.56	20.89	1.39	4.36	1.89	10.15	6.92	100.00
Quarries	19.08	16.18	19.66	8.09	4.05	16.76	.....	16.18	100.00
1917:									
Metal mines	**26.17**	**9.27**	**10.33**	**13.15**	**2.23**	**2.00**	.....	**36.85**	**100.00**
Coal mines	45.18	4.08	22.11	.96	3.52	2.34	13.43	8.38	100.00
Quarries	18.32	16.03	24.43	11.45	1.52	15.27	.....	12.98	100.00
1918:									
Metal mines	**29.72**	**13.78**	**13.00**	**12.85**	**3.87**	**3.25**	.....	**23.53**	**100.00**
Coal mines	50.13	5.23	24.20	.81	3.99	2.21	5.01	8.42	100.00
Quarries	14.40	13.60	24.80	12.00	3.20	14.40	.....	17.60	100.00
1919:									
Metal mines	**38.46**	**10.26**	**10.90**	**16.02**	**3.42**	**4.27**	.....	**16.67**	**100.00**
Coal mines	47.48	8.89	20.37	.86	3.41	2.07	8.24	8.68	100.00
Quarries	12.19	19.51	25.20	6.51	4.07	16.25	.....	16.27	100.00
1920:									
Metal mines	**33.41**	**13.41**	**14.11**	**10.59**	**4.24**	**4.24**	.....	**20.00**	**100.00**
Coal mines	49.87	5.64	21.37	1.19	4.11	2.70	7.26	7.86	100.00
Quarries	18.54	20.23	25.84	7.30	3.93	11.80	.....	12.36	100.00
1921:									
Metal mines	**31.30**	**10.00**	**10.00**	**17.39**	**1.74**	**2.61**	.....	**26.96**	**100.00**
Coal mines	51.64	7.71	19.36	.91	4.92	1.72	5.83	7.91	100.00
Quarries	16.67	14.17	17.50	9.17	7.50	15.83	.....	19.16	100.00

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FATALITIES DUE TO EXPLOSIVES.

In the number of fatalities caused by explosives, the quarrying industry shows a higher accident rate than either metal mines or coal mines. The following table shows the percentage of fatalities due to explosives since 1911 in the mining and quarrying industry:

TABLE 28.—*Fatalities, due to explosives, at mines and quarries in the United States.*

Year.	Metal mines.		Quarries.		Coal mines.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
1911	78	11.22	50	26.60	160	6.02
1912	94	14.22	47	22.06	147	6.08
1913	89	13.03	44	24.04	138	4.96
1914	60	10.73	35	19.44	146	5.95
1915	78	14.10	28	18.92	155	6.83
1916	89	12.77	28	16.18	146	6.56
1917	79	9.27	21	16.03	110	4.08
1918	89	13.78	17	13.60	135	5.23
1919	48	10.26	24	19.51	206	8.89
1920	**57**	**13.41**	**36**	**20.23**	**128**	**5.64**
1921	**23**	**10.00**	**17**	**14.17**	**152**	**7.70**

PRODUCTION, DISTRIBUTION, AND USE OF EXPLOSIVES.[1]

The mining industry is by far the largest consumer of explosives in the United States. In 1921, out of a total of 372 million pounds of explosives used in this country, 269 million pounds (72 per cent) were used in mining operations. Of this consumption, 145 million pounds were black powder, representing 90.6 per cent of the total production of this class of explosives; 39 million pounds were permissible explosives, representing 94.6 per cent of the permissible class; and 85 million pounds were other high explosives, representing 49.8 per cent.

Table 29 shows the percentage of each class of explosives used in the mining industry for each year since 1915.

[1] Adams, W. W., Production of explosives in the United States, 1921: Tech. Paper 313, Bureau of Mines, 1922, 28 pp.

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TABLE 29.—*Percentage of explosives used for various purposes in the United States, 1915 to 1921.*

	Coal mining.	Other mining.	Railway and other construction work.	All other purposes.	Total.
1921.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Black powder	87.7	2.9	2.5	6.9	100.0
High explosives	20.0	29.8	10.7	39.5	100.0
Permissible explosives	92.5	2.1	.7	4.7	100.0
Total	**57.1**	**15.2**	**6.1**	**21.6**	**100.0**
1920.					
Black powder	86.2	3.4	1.9	8.5	100.0
High explosives	16.3	38.9	6.6	38.2	100.0
Permissible explosives	83.8	6.9	.5	8.8	100.0
Total	**56.2**	**18.9**	**3.7**	**21.2**	**100.0**
1919.					
Black powder	85.0	3.5	2.8	8.7	100.0
High explosives	14.9	45.3	6.4	33.4	100.0
Permissible explosives	84.5	6.4	.5	8.6	100.0
Total	**51.7**	**23.6**	**4.3**	**20.4**	**100.0**
1918.					
Black powder	87.7	3.0	2.2	7.1	100.0
High explosives	15.2	49.6	5.8	29.4	100.0
Permissible explosives	80.9	9.9	.4	8.8	100.0
Total	**57.1**	**22.9**	**3.5**	**16.5**	**100.0**
1917.					
Black powder	85.1	3.4	4.7	6.8	100.0
High explosives	10.8	50.4	7.8	31.0	100.0
Permissible explosives	76.5	14.2	.2	9.1	100.0
Total	**51.0**	**25.4**	**5.7**	**17.9**	**100.0**
1916.					
Black powder	82.1	3.6	5.0	9.3	100.0
High explosives	8.2	51.6	8.6	31.6	100.0
Permissible explosives	76.6	17.9	.3	5.2	100.0
Total	**44.4**	**28.8**	**6.5**	**20.3**	**100.0**
1915.					
Black powder	84.8	3.4	3.6	8.2	100.0
High explosives	9.5	46.3	9.4	34.9	100.0
Permissible explosives	79.9	17.1	.5	2.5	100.0
Total	**45.9**	**26.1**	**6.4**	**21.5**	**100.0**

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ACCIDENTS AT METALLURGICAL PLANTS DURING 1921.

Table 30 shows the number of men employed, number killed and injured at ore-dressing plants, smelting plants, and auxiliary works, by States, for the calendar year 1921.

TABLE 30.—***METALLURGICAL WORKS:*** *Labor and accident statistics for the year ended December 31, 1921.*[1]

State.	Ore-dressing plants.[2]			Smelting plants.[3]			Auxiliary works.[4]		
	Men employed.	Killed.	Injured.	Men employed.	Killed.	Injured.	Men employed.	Killed.	Injured.
Alabama	45						(5)		
Alaska[6]	580	1	12						
Arizona	773		93	1,628	2	152	729	1	106
Arkansas	(5)			270		39	96		3
California	378		66	313		33	427		22
Colorado	670		79	513	1	33	250		8
Georgia[6]									
Idaho	367	1	26	(5)			159		7
Illinois	80		5	950		177	543		86
Kansas	137	1	61	(5)			(5)		
Maryland[5]									
Michigan	918		43	468		72	150		55
Minnesota	276		27				(5)		
Missouri	628		92	(5)			590	1	180
Montana	509		38	648	2	52	1,287	1	65
Nevada	494		85	213		30	84		13
New Jersey	441		27	1,742	1	197	933	1	90
New Mexico	267		9	(5)			168	1	12
New York	619		113	(5)			162		94
North Carolina[5]									
Oklahoma	353		80	985		107	233		46
Oregon	28		1	(5)			11		2
Pennsylvania	(5)			1,659		398	1,217		97
South Dakota	241		30						
Tennessee	197		18	(5)			486	4	138
Texas	(5)			4,509		18	11		4
Utah	738	1	110	1,272	2	110	537		9
Vermont	48		3				(5)		
Virginia	112		4	(5)			35		5
Washington	26		1	(5)			(5)		
West Virginia				358	2	91	(5)		
Wisconsin	69		2	(5)					
Other States	1,053		189	3,128	4	620	654		109
Total, 1921	**10,047**	**4**	**1,214**	**18,656**	**14**	**2,129**	**8,762**	**9**	**1,151**
Total 300-day workers	8,037			19,113			8,308		
Fatality and injury rates		0.49	151.05		0.73	111.39		1.08	138.54
Total, 1920	16,827	21	2,624	26,099	20	4,147	16,306	20	2,092
Total 300-day workers	16,813			30,411			18,363		
Fatality and injury rates		1.25	156.07		.66	136.37		1.08	113.92

[1] Adams, W. W., Accidents at metallurgical plants, 1921; Tech. Paper 327, Bureau of Mines, 1922, 31 pp.
[2] Stamp mills, sampling works, slime plants, lixiviation, leaching, cyanide and flotation mills.
[3] Blast, reverberatory, and roasting furnaces; converters, casting department, and refineries.
[4] Yards, shops, construction, etc.
[5] Included in "Other States."
[6] Stamp mills, other than at lode mines, not included.

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DETAILS RELATING TO CHIEF CAUSES OF ACCIDENTS.

The metal-mine accidents covered by this paper have been classified by causes into 41 main groups. It is frequently found necessary, however, to obtain more detailed information on certain classes of accidents than is afforded by such a general classification. Therefore, in order to obtain additional data regarding accidents such as those attributed generally to "explosives," "electricity," etc., a special and more elaborate report card was prepared in 1916 by the Bureau of Mines. Copies of these cards were mailed to several hundred mining companies with the suggestion that, if possible, the companies use the special form for reporting accidents in lieu of the more condensed classification card in general use by the bureau. As a result of the bureau's suggestion, a representative number of operators during the past few years have been rendering annual reports of mine accidents in accordance with the more detailed classification of causes. With these special reports as a basis, Tables 31, 32, and 33 have been compiled covering the three-year period 1919–1921. The number of mine operators represented was 109 in 1919, 106 in 1920, and 105 in 1921.

From these tables it may be noted that of the total number of underground accidents due to explosives, premature shots caused more than 24 per cent of the deaths and about 7 per cent of the injuries. Twenty per cent of the fatalities and 11 per cent of the injuries were caused by the miner returning too soon to his working place.

In like manner the tables indicate the percentage of accidents due to each cause under the general headings "handling rock or ore," "haulage," "electricity," and "other causes." The percentages for the combined three-year period have been used as a basis for segregating by causes all metal-mine accidents reported to the Bureau of Mines since 1911. The resulting figures are shown in the last column of Tables 32 and 33.

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TABLE 31.—*Summary of accidents and labor statistics compiled from* ***selected*** *representative returns.*

	1919	1920	1921	Total.	Total and average 1911–1921.
Active operators	109	106	105	320	[1] 47,013
Average days active:					
Underground	299	309	250	290	228
Open pit	281	306	224	281	([2])
Surface	290	318	256	291	278
Total	**296**	**311**	**250**	**290**	**284**
Men employed (actual number):					
Underground	30,183	27,790	19,398	77,371	1,104,689
Open pit	3,698	3,457	1,482	8,637	([2])
Surface	10,955	10,690	7,894	29,539	[3] 630,487
Total	**44,836**	**41,937**	**28,774**	**115,547**	**1,735,176**
Men employed (300-day workers):					
Underground	30,098	28,616	16,146	74,860	1,060,734
Open pit	3,468	3,523	1,107	8,098	([2])
Surface	10,607	11,319	6,735	28,661	584,173
Total	**44,173**	**43,458**	**23,988**	**111,619**	**1,644,907**
Days of labor:					
Underground	9,029,525	8,584,833	4,843,849	22,458,207	318,219,364
Open pit	1,040,260	1,056,960	331,976	2,429,196	([2])
Surface	3,182,245	3,395,718	2,020,615	8,598,578	175,252,096
Total	**13,252,030**	**13,037,511**	**7,196,440**	**33,485,981**	**493,471,460**
Killed:					
Underground	123	92	66	281	5,131
Open pit	7	9	1	17	([2])
Surface	8	6	4	18	1,179
Total	**138**	**107**	**71**	**316**	**6,310**
Injured:					
Underground	10,301	10,262	5,276	25,839	287,683
Open pit	833	789	212	1,834	([2])
Surface	1,533	1,659	887	4,079	75,991
Total	**12,667**	**12,710**	**6,375**	**31,752**	**363,674**
Killed per 1,000 300-day workers:					
Underground	4.09	3.21	4.09	3.75	4.84
Open pit	2.02	2.55	.90	2.10	([2])
Surface	.75	.53	.59	.63	2.02
Total	**3.12**	**2.46**	**2.96**	**2.83**	**3.84**
Injured per 1,000 300-day workers:					
Underground	342.25	358.61	326.77	345.16	271.21
Open pit	240.20	223.96	191.51	226.48	([2])
Surface	144.53	146.57	131.70	142.32	130.08
Total	**286.76**	**292.47**	**265.76**	**284.47**	**221.09**

[1] Average number operators reporting each year, 4,274.
[2] Included in surface.
[3] Includes open pit.

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TABLE 32.—***FATALITIES*** *at metal mines, with* ***principal causes*** *subdivided.*

[Selected returns.]

	Fatalities.				Group totals, per cent.	Total fatalities, 1911–1921.[1]
	1919	1920	1921	Total.		
UNDERGROUND.						
Number killed by—						
1. Falls of rock or ore from roof or wall	63	42	29	134		1,931
2. Handling rock or ore						80
(*a*) Loading at face						
(*b*) Loading at chute		1		1	100.00	*80*
(*c*) Sledging						
3. Timber or hand tools		1	1	2		48
4. Explosives						625
(*a*) Transportation						
(*b*) Charging						
(*c*) Suffocation	2		1	3	12.00	*75*
(*d*) Drilling into old holes			3	3	12.00	*75*
(*e*) Striking in loose rock or ore						
(*f*) Thawing						
(*g*) Caps, detonators, etc		1		1	4.00	*25*
(*h*) Unguarded shots		2		2	8.00	*50*
(*i*) Returned too soon	3		2	5	20.00	*125*
(*j*) Premature shot	5	1		6	24.00	*150*
(*k*) Miscellaneous	1	2	2	5	20.00	*125*
5. Haulage						314
(*a*) Hand and animal	2		3	5	16.67	*52*
(*b*) Mechanical	11	13	1	25	83.33	*262*
6. Persons falling down chute, winze, raise, or stope	5	5	7	17		424
7. Run of ore from chute or pocket	6	1	1	8		90
8. Drilling (by machine or hand drills)		1		1		16
9. Electricity						132
(*a*) Direct contact with trolley wire	1	3	1	5	55.56	*73*
(*b*) Tool or bar striking trolley wire						
(*c*) Contact with motor	1			1	11.11	*15*
(*d*) Others	1	2		3	33.33	*44*
10. Machinery other than 5 and 8						25
11. Mine fires	2			2		247
12. Suffocation from natural gases	1			1		45
13. Inrush of water						53
14. Nails and splinters						4
15. Other causes						139
(*a*) Falling objects, other than 1 and 2	1	4	2	7	50.00	*69*
(*b*) Flying objects, other than 2 c						
(*c*) Burns						
(*d*) Miscellaneous	1	3	3	7	50.00	*69*
Total number killed underground	**106**	**82**	**56**	**244**	**77.21**	**4,173**
SHAFT ACCIDENTS.						
Number killed by—						
16. Falling down shafts	3	4	7	14		377
17. Objects falling down shafts		1	1	2		138
18. Breaking of cables	2			2		24
19. Overwinding	3			3		20
20. Cage, skip, or bucket						293
(*a*) Runaway	1			1	7.69	*22*
(*b*) Riding with rock or ore						
(*c*) Riding with timber or tools	1	1	2	4	30.77	*91*
(*d*) Struck by	5	3		8	61.54	*180*
21. Other causes	2	1		3		106
Total number killed by shaft accidents	**17**	**10**	**10**	**37**	**11.71**	**958**

[1] All figures in italics are calculated on basis of percentage in preceding column.

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TABLE 32.—***FATALITIES*** *at metal mines, with* ***principal causes*** *subdivided*—Contd.

	Fatalities.				Group totals, per cent.	Total fatalities, 1911–1921.[1]
	1919	1920	1921	Total.		
SURFACE ACCIDENTS.						
(At surface plants and shops.)						
Number killed by—						
22. Haulage						55
(*a*) Hand and animal						
(*b*) Mechanical	1			1	100.00	*55*
23. Railway cars and locomotives	1	2	1	4		69
24. Run or fall of ore in or from ore bins	1			1		20
25. Falls of persons	1		1	2		65
26. Nails and splinters						3
27. Hand tools, axes, bars, etc			1	1		4
28. Electricity						52
(*a*) Direct contact with trolley wire		1		1	100.00	*52*
(*b*) Tool or bar striking trolley wire						
(*c*) Contact with motor						
(*d*) Others						
29. Machinery	2	1		3		80
30. Other causes						207
(*a*) Falling objects						
(*b*) Flying objects						
(*c*) Burns	1	1		2	40.00	*85*
(*d*) Miscellaneous	1	1	1	3	60.00	*124*
Total number killed by surface accidents	**8**	**6**	**4**	**18**	**5.70**	**555**
OPEN-PIT ACCIDENTS.						
Number killed in pit by—						
31. Falls or slides of rock or ore	2			2		157
32. Explosives						145
(*a*) Transportation						
(*b*) Charging		1		1	25.00	*36*
(*c*) Suffocation						
(*d*) Drilling into old holes						
(*e*) Striking in loose rock or ore						
(*f*) Thawing						
(*g*) Caps, detonators, etc						
(*h*) Unguarded shots						
(*i*) Returned too soon						
(*j*) Premature shot		1		1	25.00	*36*
(*k*) Miscellaneous	1		1	2	50.00	*73*
33. Haulage						164
(*a*) Hand and animal						
(*b*) Mechanical	1			1	14.29	*25*
(*c*) Railway cars and locomotives	2	4		6	85.71	*141*
34. Steam shovel	1	1		2		24
35. Falls of persons						27
36. Falls of derricks, booms, etc						8
37. Run or fall of ore in or from ore bins						1
38. Machinery (other than 33 and 34)						33
39. Electricity						20
(*a*) Direct contact with trolley wire		1		1	100.00	*20*
(*b*) Tool or bar striking trolley wire						
(*c*) Contact with motor						
(*d*) Others						
40. Hand tools						
41. Other causes						45
(*a*) Falling objects other than 31		1		1	100.00	*45*
(*b*) Flying objects						
(*c*) Burns						
(*d*) Miscellaneous						
Total number killed by open-pit accidents	**7**	**9**	**1**	**17**	**5.38**	**624**
Grand total	**138**	**107**	**71**	**316**	**100.00**	**6,310**

[1] All figures in italics are calculated on basis of percentage in preceding column.

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TABLE 33.—*INJURIES at metal mines, with* ***principal causes*** *subdivided.*

[Selected returns.]

	Nonfatal injuries.				Group totals (per cent).	Total injuries, 1911–1921.[1]
	1919	1920	1921	Total.		
UNDERGROUND.						
Number injured by—						
1. Falls of rock or ore from roof or wall	2,411	2,185	931	5,527	.....	71,670
2. Handling rock or ore					.....	38,387
(*a*) Loading at face	596	527	639	1,762	41.27	*15,842*
(*b*) Loading at chute	655	932	296	1,883	44.11	*16,933*
(*c*) Sledging	229	233	162	624	14.62	*5,612*
3. Timber or hand tools	1,005	1,084	478	2,567	.....	31,289
4. Explosives					.....	4,562
(*a*) Transportation	1	5	17	23	5.22	*238*
(*b*) Charging	3	4	3	10	2.27	*104*
(*c*) Suffocation	28	17	7	52	11.79	*538*
(*d*) Drilling into old holes	7	11	8	26	5.90	*269*
(*e*) Striking in loose rock or ore	20	4	.....	24	5.44	*248*
(*f*) Thawing					.....	
(*g*) Caps, detonators, etc	8	5	5	18	4.08	*186*
(*h*) Unguarded shots	6	18	9	33	7.48	*341*
(*i*) Returned too soon	20	23	6	49	11.11	*507*
(*j*) Premature shot	12	18	3	33	7.48	*341*
(*k*) Miscellaneous	67	67	39	173	39.23	*1,790*
5. Haulage					.....	39,749
(*a*) Hand and animal	1,005	843	501	2,349	57.01	*22,661*
(*b*) Mechanical	649	753	369	1,771	42.99	*17,088*
6. Persons falling down chute, winze, raise, or stope	299	216	108	623	.....	9,114
7. Run of ore from chute or pocket	168	128	91	387	.....	7,619
8. Drilling (by machine or hand drills)	505	593	325	1,423	.....	18,037
9. Electricity					.....	714
(*a*) Direct contact with trolley wire	5	4	8	17	24.29	*173*
(*b*) Tool or bar striking trolley wire	2	1	2	5	7.14	*51*
(*c*) Contact with motor	5	3	2	10	14.28	*102*
(*d*) Others	12	11	15	38	54.29	*388*
10. Machinery other than 5 and 8	74	137	65	276	.....	3,938
11. Mine fires	31	.....	.....	31	.....	242
12. Suffocation from natural gases	36	12	13	61	.....	487
13. Inrush of water					.....	246
14. Nails and splinters	195	227	108	530	.....	5,081
15. Other causes					.....	47,335
(*a*) Falling objects, other than 1 and 2	495	522	221	1,238	24.98	*11,824*
(*b*) Flying objects, other than 2*c*	243	243	110	596	12.02	*5,690*
(*c*) Burns	64	39	25	128	2.58	*1,221*
(*d*) Miscellaneous	1,155	1,230	610	2,995	60.42	*28,600*
Total number injured underground	**10,011**	**10,095**	**5,176**	**25,282**	**79.62**	**278,470**
SHAFT ACCIDENTS.						
Number injured by—						
16. Falling down shafts	14	9	3	26	.....	841
17. Objects falling down shafts	59	43	22	124	.....	2,800
18. Breaking of cables	11	1	.....	12	.....	101
19. Overwinding	1	.....	1	2	.....	85
20. Cage, skip, or bucket					.....	2,657
(*a*) Runaway	8	5	8	21	18.26	*485*
(*b*) Riding with rock or ore	3	1	3	7	6.09	*162*
(*c*) Riding with timber or tools	8	12	5	25	21.74	*578*
(*d*) Struck by	28	17	17	62	53.91	*1,432*
21. Other causes	158	79	41	278	.....	2,729
Total number injured by shaft accidents	**290**	**167**	**100**	**557**	**1.75**	**9,213**

[1] All figures in italics are calculated on basis of percentage in preceding column.

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TABLE 33.—***INJURIES*** *at metal mines, with* ***principal causes*** *subdivided*—Contd.

[Selected returns.]

	Nonfatal injuries.				Group totals (per cent.)	Total injuries, 1911-1921.
	1919	1920	1921	Total.		
SURFACE ACCIDENTS.						
(At surface plants and shops.)						
Number injured by—						
22. Haulage						3,000
(a) Hand and animal	54	39	13	106	44.73	*1,342*
(b) Mechanical	59	48	24	131	55.27	*1,658*
23. Railway cars and locomotives	34	45	33	112		1,356
24. Run or fall of ore in or from ore bin	31	29	7	67		959
25. Falls of persons	169	134	70	373		4,611
26. Nails and splinters	78	103	109	290		2,709
27. Hand tools, axes, bars, etc	190	187	130	507		6,265
28. Electricity						444
(a) Direct contact with trolley wire	2	2	1	5	11.37	*51*
(b) Tool or bar striking trolley wire		1		1	2.27	*10*
(c) Contact with motor	1	3		4	9.09	*40*
(d) Others	11	11	12	34	77.27	*343*
29. Machinery	105	120	67	292		5,018
30. Other causes						19,770
(a) Falling objects	142	186	83	411	19.06	*3,768*
(b) Flying objects	100	83	69	252	11.68	*2,309*
(c) Burns	55	33	40	128	5.93	*1,173*
(d) Miscellaneous	502	635	229	1,366	63.33	*12,520*
Total number injured by surface accidents	**1,533**	**1,659**	**887**	**4,079**	**12.85**	**44,132**
OPEN-PIT ACCIDENTS.						
Number injured in pit by—						
31. Falls or slides of rock or ore	102	45	38	185		5,230
32. Explosives						1,127
(a) Transportation		1		1	2.44	*27*
(b) Charging		3		3	7.32	*83*
(c) Suffocation						
(d) Drilling into old holes	1			1	2.44	*27*
(e) Striking in loose rock or ore			1	1	2.44	*27*
(f) Thawing						
(g) Caps, detonators, etc						
(h) Unguarded shots		2	1	3	7.32	*83*
(i) Returned too soon						
(j) Premature shot		2	2	4	9.75	*110*
(k) Miscellaneous	8	19	1	28	68.29	*770*
33. Haulage						3,694
(a) Hand and animal	4	11	6	21	10.00	*370*
(b) Mechanical	10	3	1	14	6.67	*246*
(c) Railway cars and locomotives	106	50	19	175	83.33	*3,078*
34. Steam shovel	49	43	7	99		2,359
35. Falls of persons	57	59	22	138		2,839
36. Falls of derricks, booms, etc	1	1		2		281
37. Run or fall of ore in or from ore bins	1			1		138
38. Machinery (other than 33 and 34)	27	30	4	61		1,761
39. Electricity						89
(a) Direct contact with trolley wire						
(b) Tool or bar striking trolley wire						
(c) Contact with motor						
(d) Others	1	1	1	3	100.00	*89*
40. Hand tools	105	108	27	240		3,159
41. Other causes						11,182
(a) Falling objects other than 31	71	85	10	166	19.44	*2,174*
(b) Flying objects	44	28	8	80	9.37	*1,048*
(c) Burns	20	15	2	37	4.33	*484*
(d) Miscellaneous	226	283	62	571	66.86	*7,476*
Total number injured by open-pit accidents	**833**	**789**	**212**	**1,834**	**5.78**	**31,859**
Grand total	**12,667**	**12,710**	**6,375**	**31,752**	**100.00**	**363,674**

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TABLE 34.—***Eleven-year** summary of accident data, by **kinds of mines.***

Kind of mine.	Active operators.	Number of men employed.								Active days.				Total shifts.			
		Actual number.				Equivalent in 300-day workers.											
		Underground.	Open pit.	Surface.	Total.	Underground.	Open pit.	Surface.	Total.	Underground.	Open pit.	Surface.	Total.	Underground.	Open pit.	Surface.	Total.
Copper:																	
1921	**357**	**12,865**	**665**	**4,770**	**18,300**	**10,863**	**392**	**3,616**	**14,871**	**253**	**177**	**227**	**244**	**3,258,838**	**117,625**	**1,084,833**	**4,461,296**
1920	387	23,671	2,766	8,817	35,254	24,731	3,153	9,390	37,274	313	342	319	317	7,419,225	945,979	2,816,915	11,182,119
1919	410	27,298	2,466	9,563	39,327	27,209	2,879	9,434	39,522	299	350	296	301	8,162,636	863,571	2,830,284	11,856,491
1918	524	42,286	3,737	13,424	59,447	45,001	4,444	14,236	63,681	319	357	318	321	13,509,466	1,332,986	4,270,726	19,104,178
1917	649	43,715	3,823	13,737	61,275	45,191	4,405	14,023	63,619	311	346	306	311	13,557,232	1,321,337	4,206,994	19,085,563
1916	604	43,215	2,981	15,032	61,228	44,735	3,585	14,787	63,107	311	361	295	309	13,420,350	1,075,648	4,436,144	18,932,142
1915	548	32,421	2,992	11,761	47,174	32,142	3,513	11,716	47,371	297	352	299	301	9,642,691	1,053,771	3,514,938	14,211,400
1914	585	31,265	3,312	10,109	44,686	29,732	3,799	9,286	42,817	285	344	276	287	8,919,564	1,139,582	2,785,912	12,845,058
1913	694	39,917	.....	16,222	56,139	41,168	.....	16,730	57,898	309	.....	309	309	12,350,220	.....	5,019,046	17,369,266
1912	814	37,539	.....	14,237	51,776	38,260	.....	14,511	52,771	306	.....	306	306	11,478,084	.....	4,353,166	15,831,250
1911	396	31,557	.....	13,136	44,693	32,419	.....	13,495	45,914	308	.....	308	308	9,725,827	.....	4,048,498	13,774,325
Gold and misc. metal:																	
1921	**2,135**	**17,642**	**677**	**8,197**	**26,516**	**16,545**	**449**	**6,744**	**23,738**	**281**	**199**	**247**	**269**	**4,963,389**	**134,712**	**2,023,301**	**7,121,402**
1920	2,358	20,077	1,712	8,144	29,933	19,356	1,290	7,203	27,849	289	226	265	279	5,806,783	387,090	2,160,957	8,354,830
1919	2,430	21,868	945	9,317	32,130	19,626	738	8,226	28,590	269	234	265	267	5,887,825	221,403	2,467,867	8,577,095
1918	2,429	28,061	1,877	13,705	43,643	28,722	1,678	11,975	42,375	307	268	262	291	8,616,538	503,549	3,592,469	12,712,556
1917	3,166	35,812	2,255	13,825	51,892	34,473	2,154	11,979	48,606	289	287	260	281	10,341,808	646,274	3,593,720	14,581,811
1916	3,921	42,158	1,046	16,903	60,107	38,286	859	14,494	53,639	272	246	257	268	11,485,733	257,815	4,348,194	16,091,742
1915	3,120	29,163	3,865	12,284	45,312	28,198	2,538	10,840	41,576	290	197	265	275	8,459,270	761,502	3,251,910	12,472,682
1914	3,536	35,432	1,420	11,586	48,438	33,012	1,063	10,063	44,138	280	225	261	273	9,903,462	318,805	3,019,013	13,241,280
1913	4,749	44,810	.....	14,691	59,501	41,254	.....	13,525	54,779	276	.....	276	276	12,376,094	.....	4,057,514	16,433,608
1912	4,137	31,322	.....	12,822	44,144	28,925	.....	11,841	40,766	277	.....	277	277	8,677,523	.....	3,552,238	12,229,761
1911	3,817	35,176	.....	13,743	48,919	32,388	.....	12,654	45,042	276	.....	276	276	9,716,478	.....	3,796,155	13,512,633
Iron:																	
1921	**122**	**17,501**	**5,956**	**7,102**	**30,559**	**11,449**	**5,046**	**4,874**	**21,369**	**196**	**254**	**206**	**210**	**3,434,610**	**1,513,721**	**1,462,242**	**6,410,573**
1920	154	25,627	9,257	11,106	45,990	24,946	8,788	11,515	45,249	292	285	311	295	7,483,915	2,936,253	3,454,620	13,574,788
1919	157	28,234	7,041	12,401	47,676	27,389	5,994	11,579	44,962	291	255	280	283	8,216,645	1,798,290	3,473,678	13,488,613
1918	176	28,775	11,484	13,406	53,665	28,515	10,577	12,786	51,878	297	276	286	290	8,554,423	3,172,967	3,835,942	15,563,332
1917	205	31,549	11,177	14,504	57,230	31,032	9,700	13,228	53,960	295	260	274	283	9,309,613	2,909,920	3,968,518	16,188,051
1916	199	30,485	9,700	13,303	53,488	29,766	7,495	12,303	49,564	293	232	277	278	8,929,720	2,248,495	3,690,912	14,869,127
1915	191	23,302	6,321	9,768	39,391	21,447	5,414	8,842	35,703	276	257	272	272	6,434,096	1,624,266	2,652,436	10,710,798
1914	196	24,847	8,149	11,811	44,807	22,305	6,336	10,512	39,153	269	233	267	262	6,691,481	1,900,761	3,153,736	11,745,978
1913	206	29,384	.....	21,749	51,133	28,856	.....	21,359	50,215	295	.....	295	295	8,656,898	.....	6,407,531	15,064,429
1912	194	26,799	.....	18,947	45,746	25,455	.....	17,997	43,452	285	.....	285	285	7,636,470	.....	5,399,015	13,035,485
1911	207	25,461	.....	20,492	45,953	23,546	.....	18,951	42,497	277	.....	277	277	7,063,856	.....	5,685,265	12,749,121

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Lead and zinc (Mississippi Valley):																	
1921	**66**	**5,302**	**30**	**1,616**	**6,948**	**4,200**	**17**	**1,214**	**5,431**	**238**	**172**	**225**	**234**	**1,259,899**	**5,150**	**364,142**	**1,629,191**
1920	119	8,861	23	2,754	11,638	8,221	14	2,763	10,998	278	185	301	283	2,466,25(	4,250	828,778	3,299,278
1919	141	10,075	66	2,827	12,968	8,429	55	2,413	10,897	251	250	256	252	2,528,821	16,500	723,905	3,269,226
1918	236	10,334	46	3,624	14,004	8,775	12	2,936	11,723	255	77	243	251	2,632,533	3,554	880,916	3,517,003
1917	369	15,075	237	4,957	20,269	12,444	145	4,055	16,644	248	183	245	246	3,733,344	43,463	1,216,583	4,993,390
1916	285	14,687	291	5,637	20,615	12,939	248	4,955	18,142	264	256	264	264	3,881,680	74,430	1,486,468	5,442,578
1915	241	9,493	34	3,450	12,977	8,234	14	2,920	11,168	260	127	254	258	2,470,054	4,328	876,004	3,350,386
1914	248	7,609	27	3,299	10,935	6,467	18	2,779	9,264	255	205	253	254	1,939,979	5,536	833,594	2,779,109
1913	409	9,261	.....	3,436	12,697	7,845	.....	2,911	10,756	254	.....	254	254	2,353 484	.....	873 185	3,226,669
1912	464	10,812	.....	3,520	14,332	9,513	.....	3,097	12,610	264	.....	264	264	2,853,837	.....	929,107	3,782,944
1911	483	9,247	.....	3,274	12,521	7,883	.....	2,791	10,674	256	.....	256	256	2,364,989	.....	837,350	3,202,339
Nonmetallic mineral:																	
1921	**216**	**2,630**	**4,543**	**4,433**	**11,606**	**2,142**	**3,181**	**3,778**	**9,101**	**244**	**210**	**256**	**235**	**642,532**	**954,239**	**1,133,469**	**2,730,240**
1920	263	3,149	5,374	5,245	13,768	2,961	4,910	5,299	13,170	282	274	303	287	888,214	1,473,023	1,589,641	3,950,878
1919	245	3,356	4,320	5,485	13,161	3,116	3,660	4,724	10,900	279	212	258	248	934,811	917,955	1,417,159	3,269,925
1918	271	2,690	3,338	5,819	11,847	2,425	3,131	5,793	11,349	270	281	299	287	727,521	939,371	1,737,787	3,404,679
1917	248	2,726	3,006	4,181	9,913	2,850	2,547	3,859	9,256	314	254	277	280	855,138	764,206	1,157,652	2,776,996
1916	249	2,618	2,510	4,119	9,247	2,295	1,999	3,709	8,003	263	239	270	260	688,476	599,663	1,112,697	2,400,836
1915	222	1,844	2,517	2,903	7,264	1,464	2,138	2,577	6,179	238	255	266	255	439,081	641,443	773,225	1,853,749
1914	240	2,465	4,125	2,659	9,249	2,102	3,102	2,044	7,248	256	226	231	235	639,531	930,680	613,204	2,174,415
1913	329	2,997	.....	8,809	11,806	2,525	.....	7,421	9,946	253	.....	253	253	757,471	.....	2,226,412	2,983,883
1912	358	3,584	.....	9,617	13,201	3,275	.....	8,789	12,064	274	.....	274	274	982,558	.....	2,636,512	3,619,070
1911	329	3,182	.....	10,711	13,893	2,740	.....	9,221	11,961	258	.....	258	258	821,817	.....	2,766,338	3,588,155
Total United States:																	
1921	**2,896**	**55,940**	**11,871**	**26,118**	**93,929**	**45,199**	**9,085**	**20,226**	**74,510**	**242**	**230**	**232**	**238**	**13,559,268**	**2,725,447**	**6,067,987**	**22,352,702**
1920	3,281	81,385	19,132	36,066	136,583	80,215	18,155	36,170	134,540	286	285	301	296	24,064,387	5,446,595	10,850,911	40,361,893
1919	3,383	90,831	14,838	39,593	145,262	85,769	12,726	36,376	134,871	283	257	276	279	25,730,738	3,817,719	10,912,893	40,461,350
1918	3,636	112,146	20,482	49,978	182,606	113,438	19,842	47,726	181,006	304	201	286	297	34,031,481	5,952,427	14,317,840	54,301,748
1917	4,637	128,877	20,498	51,204	200,579	125,990	18,951	47,154	192,085	293	277	276	287	37,797,135	5,685,200	14,143,476	57,625,811
1916	5,258	133,163	16,528	54,994	204,685	128,021	14,186	50,248	192,455	288	258	274	282	38,405,959	4,256,051	15,074,415	57,736,425
1915	4,322	96,223	15,729	40,166	152,118	91,485	13,617	36,895	141,997	285	200	276	280	27,445,192	4,085,310	11,068,513	42,599,015
1914	4,805	101,618	17,033	39,464	158,115	93,618	14,318	34,684	142,620	276	252	264	271	28,085,017	4,205,364	10,405,459	42,785,840
1913	6,387	126,369	.....	64,907	191,276	121,648	.....	61,946	183,594	289	.....	286	288	36,494,167	.....	18,583,688	55,077,855
1912	5,967	110,056	.....	59,143	169,199	105,428	.....	50,235	161,663	287	.....	285	287	31,628,472	.....	16,870,038	48,498,510
1911	5,232	104,623	.....	61,356	165,979	98,976	.....	57,112	156,088	284	.....	279	282	29,692,967	.....	17,133,606	46,826,573

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TABLE 34.—***Eleven-year** summary of accident data, by **kinds of mines**—Continued.*

Kind of mine.	Number killed.				Number injured.				Accident rates per 1,000 300-day workers.								Widows.	Orphans.
									Fatal.				Nonfatal.					
	Underground and shaft.	Open pit.	Surface.	Total.	Underground and shaft.	Open pit.	Surface.	Total.	Underground and shaft.	Open pit.	Surface.	Total.	Underground and shaft.	Open pit.	Surface.	Total.		
Copper:																		
1921	**49**	.....	**6**	**55**	**4,073**	**154**	**495**	**4,722**	**4.51**	.....	**1.66**	**3.70**	**374.94**	**392.86**	**136.89**	**317.53**	**27**	**39**
1920	107	15	6	128	9,624	951	1,472	12,047	4.33	4.76	.64	3.43	389.15	301.62	156.76	323.20	46	78
1919	120	15	5	140	10,002	913	1,321	12,236	4.41	5.21	.53	3.54	367.60	317.12	140.03	309.60	59	109
1918	180	24	16	220	17,201	1,311	2,001	20,513	4.00	5.40	1.12	3.45	382.24	295.00	140.56	322.12	93	177
1917	352	13	9	374	16,532	1,354	2,049	19,935	7.79	2.95	.64	5.88	365.83	307.38	146.12	313.35	142	336
1916	188	21	21	230	16,643	1,481	2,044	20,168	4.20	5.86	1.42	3.64	372.04	413.11	138.23	319.58	84	157
1915	143	9	24	176	12,526	1,284	1,444	15,254	4.45	2.56	2.05	3.72	389.71	365.50	123.25	322.01	99	186
1914	147	10	8	165	11,039	1,342	986	13,367	4.94	2.63	.86	3.85	371.28	353.25	106.18	312.19	69	106
1913	203	24	9	236	10,938	1,521	904	13,363	4.93	.....	1.97	4.08	265.69	.....	144.95	230.80	100	180
1912	185	23	31	239	11,778	951	908	13,637	4.84	.....	3.72	4.53	307.84	.....	128.11	258.42	87	159
1911	199	17	22	238	8,796	807	739	10,342	6.14	.....	2.89	5.18	271.32	.....	114.56	225.25	91	195
Gold and miscellaneous metal:																		
1921	**66**	.....	**12**	**78**	**4,439**	**36**	**877**	**5,352**	**3.99**	.....	**1.78**	**3.29**	**268.30**	**80.18**	**130.04**	**225.46**	**25**	**34**
1920	100	2	15	117	4,794	75	835	5,704	5.17	1.55	2.08	4.20	247.68	58.14	115.92	204.82	37	56
1919	113	3	10	126	4,656	74	739	5,469	5.76	4.07	1.22	4.41	237.24	100.27	89.84	191.29	49	72
1918	152	12	17	181	5,429	277	2,141	7,847	5.29	7.15	1.42	4.27	189.02	165.08	178.79	185.18	40	72
1917	166	4	26	196	7,144	215	1,026	8,385	4.82	1.86	2.17	4.03	207.23	99.81	85.65	172.51	41	60
1916	190	2	25	217	8,325	618	1,291	10,234	4.96	2.33	1.72	4.05	217.44	719.44	89.07	190.79	71	116
1915	168	20	11	199	6,990	466	921	8,377	5.96	7.88	1.01	4.79	247.89	183.61	84.96	201.49	77	133
1914	154	14	11	179	4,656	415	530	5,601	4.66	13.17	1.09	4.06	141.04	390.40	52.67	126.90	60	87
1913	180	12	18	210	3,325	223	307	3,855	4.36	.....	2.22	3.83	80.60	.....	39.19	70.37	67	70
1912	147	17	12	176	3,311	166	316	3,793	5.08	.....	2.45	4.32	114.47	.....	40.71	93.04	71	98
1911	163	5	25	193	3,232	109	277	3,618	5.03	.....	2.37	4.28	99.79	.....	30.50	80.33	61	118
Iron:																		
1921	**45**	**14**	**6**	**65**	**3,126**	**751**	**630**	**4,507**	**3.93**	**2.77**	**1.23**	**3.04**	**273.04**	**148.83**	**129.26**	**210.91**	**43**	**108**
1920	86	6	14	106	6,734	1,010	1,328	9,072	3.45	.68	1.22	2.34	269.94	114.93	115.33	200.49	60	130
1919	107	15	17	139	6,907	813	1,378	9,098	3.91	2.50	1.47	3.09	252.18	135.64	119.01	202.35	77	176
1918	128	40	11	179	6,858	1,493	1,270	9,621	4.49	3.78	.86	3.45	240.50	141.16	99.33	185.45	102	282
1917	135	36	20	191	8,872	1,709	1,697	12,278	4.35	3.71	1.51	3.54	285.90	175.98	128.29	227.54	85	190
1916	133	16	20	169	9,246	1,137	1,521	11,904	4.47	2.13	1.63	3.41	310.62	151.70	123.63	240.17	88	222
1915	78	18	7	103	6,631	758	948	8,337	3.64	3.32	.79	2.88	309.18	140.01	.....	233.51	67	127
1914	120	17	11	148	6,585	1,058	1,130	8,773	5.38	2.68	1.05	3.78	295.23	166.98	107.50	224.07	86	178
1913	122	28	15	165	9,864	2,182	1,427	13,473	4.23	.....	2.01	3.29	341.84	.....	168.98	268.31	81	178
1912	136	27	9	172	7,854	1,472	1,181	10,507	5.34	.....	2.00	3.96	308.54	.....	147.41	241.81	84	198
1911	136	51	10	197	7,844	2,093	785	10,722	5.78	.....	3.22	4.64	333.14	.....	151.87	252.30	114	237

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Lead and zinc (Mississippi Valley):																		
1921	**14**	.....	.....	**14**	**1,875**	**3**	**184**	**2,062**	**3.33**	.....	.....	**2.58**	**446.43**	**176.47**	**151.57**	**379.67**	**9**	**32**
1920	33	.....	3	36	3,223	1	383	3,607	4.01	.....	1.09	3.27	392.04	71.43	138.62	327.97	19	28
1919	42	.....	3	45	2,822	.....	363	3,185	4.98	.....	1.24	4.13	334.80	.....	150.44	292.28	27	54
1918	43	.....	4	47	3,145	9	592	3,746	4.90	.....	1.36	3.58	358.40	.....	201.63	319.54	29	59
1917	65	.....	3	68	3,777	36	731	4,544	5.22	.....	.74	4.09	303.50	248.28	180.27	272.99	43	82
1916	52	.....	5	57	3,844	69	860	4,773	4.02	.....	1.01	3.14	297.09	278.23	173.56	263.09	31	61
1915	54	2	4	60	2,370	6	285	2,661	6.56	142.86	1.37	5.37	287.83	428.57	97.60	238.27	23	28
1914	37	1	2	40	1,475	2	274	1,751	5.72	55.56	.72	4.32	228.08	111.11	98.60	189.01	23	53
1913	32	4	6	42	1,141	25	270	1,436	4.08	.....	3.44	3.90	145.44	.....	101.34	133.51	25	46
1912	48	1	5	54	1,748	19	229	1,996	5.05	.....	1.94	4.28	183.75	.....	80.08	158.29	26	62
1911	32	1	10	43	1,300	21	167	1,488	4.06	.....	3.94	4.03	164.91	.....	67.36	139.40	26	40
Nonmetallic mineral:																		
1921	**8**	**6**	**4**	**18**	**627**	**409**	**925**	**1,961**	**3.73**	**1.89**	**1.06**	**1.98**	**292.72**	**128.58**	**244.84**	**215.47**	**8**	**19**
1920	8	15	15	38	571	535	1,026	2,132	2.70	3.05	2.83	2.89	192.84	108.96	193.62	161.88	18	24
1919	6	5	7	18	414	263	841	1,518	1.93	1.63	1.48	1.65	132.86	85.95	178.03	139.27	9	20
1918	10	2	7	19	334	170	684	1,188	4.12	.64	1.21	1.67	137.73	54.30	118.07	104.69	14	25
1917	9	7	7	23	430	212	502	1,144	3.16	2.75	1.81	2.48	150.88	83.24	130.09	123.60	15	28
1916	11	8	5	24	391	223	544	1,158	4.79	4.00	1.35	3.00	170.37	111.56	146.67	144.70	11	18
1915	8	5	2	15	212	179	275	666	5.46	2.34	.78	2.43	144.81	83.72	106.71	107.78	9	10
1914	8	14	5	27	242	286	196	724	3.81	4.47	2.45	3.73	115.13	92.20	95.89	99.89	14	18
1913	11	18	1	30	257	545	42	844	4.36	.....	2.56	3.02	101.78	.....	79.10	84.86	13	27
1912	6	12	2	20	169	591	41	801	1.83	.....	1.59	1.66	51.60	.....	71.91	66.40	5	3
1911	12	12	.....	24	206	177	24	407	4.38	.....	1.30	2.01	75.18	.....	21.80	34.03	5	10
Total United States:																		
1921	**182**	**20**	**28**	**230**	**14,140**	**1,353**	**3,111**	**18,604**	**4.03**	**2.20**	**1.38**	**3.09**	**312.84**	**148.93**	**153.81**	**249.69**	**112**	**232**
1920	334	38	53	425	24,946	2,572	5,044	32,562	4.16	2.09	1.47	3.16	310.99	141.67	139.45	242.02	180	316
1919	388	38	42	468	24,801	2,063	4,642	31,506	4.52	2.99	1.15	3.47	289.16	162.11	127.61	233.60	221	431
1918	513	78	55	646	32,967	3,260	6,688	42,915	4.52	3.93	1.15	3.57	290.62	164.30	140.13	237.09	278	615
1917	727	60	65	852	36,755	3,526	6,005	46,286	5.77	3.17	1.38	4.44	291.73	186.06	127.38	240.97	325	602
1916	574	47	76	697	38,449	3,528	6,260	48,237	4.48	3.31	1.51	3.62	300.33	248.70	124.58	250.64	285	574
1915	451	54	48	553	28,729	2,693	3,873	35,295	4.93	3.97	1.30	3.89	314.03	197.77	104.97	248.56	275	484
1914	466	56	37	559	23,997	3,103	3,116	30,216	4.98	3.91	1.07	3.92	256.33	216.72	89.84	211.87	252	442
1913	548	86	49	683	25,525	4,496	2,950	32,971	4.50	.....	2.18	3.72	209.83	.....	120.20	179.59	286	501
1912	522	80	59	661	24,860	3,199	2,675	30,734	4.95	.....	2.47	4.09	235.80	.....	104.45	190.11	273	520
1911	542	86	67	695	21,378	3,207	1,992	26,577	5.48	.....	2.68	4.45	215.99	.....	90.03	170.27	297	600

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TABLE 35.—***FATALITIES:*** *By kinds of mines and causes,*

Kind of mine.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Copper:										
1921	**22**	.....	.....	**9**	**1**	**4**	**1**	.....	.....	.....
1920	47	2	1	14	7	7	2	.....	2	.....
1919	50	1	.....	10	8	12	2	1	2	1
1918	63	10	1	19	25	10	3	.....	6	.....
1917	75	6	1	19	13	15	2	.....	3	.....
1916	66	3	.....	18	7	14	3	.....	7	.....
1915	69	2	4	16	5	13	2	.....	5	.....
1914	57	2	1	14	10	22	4	1	5	.....
1913	76	2	1	23	20	25	6	.....	6	.....
1912	87	.....	4	21	9	16	6	1	9	.....
1911	82	.....	6	18	5	19	6	.....	6	3
Gold and miscellaneous metal:										
1921	**21**	.....	**1**	**6**	**3**	**6**	**4**	.....	**1**	.....
1920	33	2	.....	18	3	9	1	1	5	1
1919	31	2	1	17	3	13	2	.....	5	.....
1918	51	1	2	16	5	25	3	1	5	1
1917	42	2	1	28	4	26	3	.....	6	1
1916	66	5	1	28	9	13	4	.....	5	1
1915	49	4	2	37	7	23	5	1	4	.....
1914	52	1	.....	22	6	21	1	2	3	.....
1913	68	1	3	35	2	21	2	.....	5	4
1912	49	1	1	27	7	17	2	.....	5	.....
1911	40	.....	2	24	7	18	6	.....	7	5
Iron:										
1921	**11**	**2**	.....	**3**	**5**	**2**	.....	.....	**1**	.....
1920	42	4	2	7	12	2	3	1	1	.....
1919	61	1	.....	7	17	5	2	.....	2	.....
1918	46	1	1	15	8	3	.....	3	5	.....
1917	60	4	.....	7	16	13	2	1	1	1
1916	53	1	1	15	16	12	3	.....	3	.....
1915	42	3	1	6	4	8	3	.....	1	.....
1914	51	3	1	8	13	5	.....	.....	.....	.....
1913	52	7	3	11	12	4	2	.....	4	.....
1912	55	1	1	15	17	9	1	1	2	2
1911	45	.....	1	11	6	10	2	.....	.....	2
Lead and zinc (Mississippi Valley):										
1921	**9**	.....	.....	**2**	.....	**1**	.....	.....	.....	.....
1920	13	1	.....	3	6	.....	.....	.....	1	.....
1919	19	.....	1	7	2	.....	4	.....	.....	.....
1918	13	1	.....	4	3	.....	.....	.....	.....	.....
1917	23	3	.....	15	3	2	.....	.....	1	.....
1916	27	1	.....	10	1	1	1	.....	1	1
1915	27	1	.....	11	1	1	.....	.....	.....	.....
1914	20	1	1	4	.....	.....	.....	.....	.....	1
1913	16	.....	1	7	1	1	.....	.....	1	.....
1912	18	.....	.....	9	1	1	1	.....	3	.....
1911	18	.....	1	3	2	.....	.....	.....	2	.....
Nonmetallic mineral:										
1921	**5**	.....	.....	.....	.....	.....	.....	.....	.....	.....
1920	3	.....	.....	2	1	.....	.....	1	.....	.....
1919	3	.....	.....	.....	1	.....	.....	.....	1	.....
1918	5	.....	.....	2	1	.....	.....	.....	.....	.....
1917	6	.....	.....	.....	.....	.....	.....	1	.....	1
1916	5	.....	.....	3	.....	.....	.....	.....	1	.....
1915	4	.....	.....	2	1	.....	.....	.....	.....	.....
1914	5	.....	.....	1	2	.....	.....	.....	.....	.....
1913	8	.....	.....	1	.....	1	.....	.....	.....	.....
1912	3	.....	.....	1	1	.....	.....	.....	.....	.....
1911	6	.....	.....	6	.....	.....	.....	.....	.....	.....
Total, United States:										
1921	**68**	**2**	**1**	**20**	**9**	**13**	**5**	.....	**2**	.....
1920	138	9	3	44	29	18	6	3	9	1
1919	164	4	2	41	31	30	10	1	10	1
1918	178	13	4	56	42	38	6	4	16	1
1917	206	15	2	69	36	56	7	2	11	3
1916	217	10	2	74	33	40	11	.....	17	2
1915	191	10	7	72	18	45	10	1	10	.....
1914	185	7	3	49	31	48	5	3	8	1
1913	220	10	8	77	35	52	10	.....	16	4
1912	212	2	6	73	35	43	10	2	19	2
1911	191	.....	10	62	20	47	14	.....	15	10
Total, 11 years	**1,970**	**82**	**48**	**637**	**319**	**430**	**94**	**16**	**133**	**25**

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during the years ended December 31, 1911 to 1921.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total, underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
.....	.....	.....	.....	2	39	4	2	.....	.....	4	.....	10
.....	2	.....	.....	6	90	6	3	.....	.....	6	2	17
1	1	.....	.....	3	92	11	.....	2	3	10	2	28
3	.....	.....	1	4	145	9	3	3	1	14	5	35
164	3	2	.....	12	315	9	6	.....	1	15	6	37
23	1	.....	.....	8	150	17	2	.....	.....	13	6	38
.....	.....	.....	1	2	119	8	3	1	1	9	2	24
2	.....	.....	.....	1	119	8	2	.....	.....	15	3	28
.....	.....	.....	.....	12	171	9	7	.....	1	9	6	32
.....	1	.....	.....	3	157	11	2	.....	.....	14	1	28
12	2	.....	.....	1	160	17	5	.....	.....	.....	17	39
.....	4	.....	.....	4	50	10	3	.....	.....	2	1	16
.....	4	.....	.....	4	81	8	.....	1	.....	8	2	19
2	2	.....	.....	2	80	15	2	.....	5	7	4	33
.....	2	1	.....	8	121	13	6	.....	.....	10	2	31
1	.....	2	.....	7	123	10	10	2	2	16	3	43
4	4	.....	.....	10	150	16	6	2	2	11	3	40
.....	2	.....	.....	.....	134	19	6	.....	.....	6	3	34
4	1	.....	.....	3	116	13	2	2	.....	19	2	38
.....	3	.....	.....	6	150	10	5	.....	.....	13	2	30
1	3	.....	.....	1	114	16	2	2	.....	10	3	33
17	5	.....	.....	2	133	16	8	3	.....	.....	3	30
.....	1	.....	.....	2	27	6	2	.....	.....	10	.....	18
.....	.....	.....	.....	2	76	5	1	.....	.....	4	.....	10
1	1	.....	.....	.....	97	3	3	.....	.....	3	1	10
.....	.....	17	.....	4	103	8	5	.....	1	11	.....	25
.....	1	.....	.....	1	107	15	2	1	.....	9	1	28
.....	1	1	1	4	111	8	7	.....	.....	7	.....	22
.....	1	.....	.....	1	70	2	1	1	.....	3	1	8
2	.....	8	.....	2	93	10	4	.....	.....	7	6	27
.....	.....	.....	.....	3	98	6	2	2	1	11	2	24
.....	.....	5	.....	2	111	7	4	.....	.....	13	1	25
8	1	12	.....	5	103	23	3	1	.....	.....	6	33
.....	.....	.....	.....	1	13	1	.....	.....	.....	.....	.....	1
.....	1	.....	.....	1	26	3	2	.....	.....	1	1	7
.....	.....	.....	.....	2	35	3	1	.....	.....	3	.....	7
.....	1	2	.....	1	25	8	2	.....	1	5	2	18
.....	2	.....	.....	2	51	7	3	1	.....	1	2	14
.....	.....	.....	1	.....	44	4	3	.....	.....	1	.....	8
.....	.....	3	.....	.....	44	5	2	.....	.....	2	1	10
2	.....	.....	.....	1	30	3	2	.....	.....	2	.....	7
.....	.....	.....	.....	1	28	1	1	.....	1	1	.....	4
.....	.....	.....	.....	2	35	5	4	.....	.....	.....	4	13
.....	.....	.....	.....	2	28	1	2	.....	.....	.....	1	4
.....	.....	.....	.....	2	7	1	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	7	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	5	.....	1	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	8	1	1	.....	.....	.....	.....	2
.....	.....	.....	.....	1	9	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	1	10	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	7	.....	1	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	8	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	1	11	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	5	1	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	12	.....	.....	.....	.....	.....	.....	.....
.....	5	.....	.....	11	136	22	7	.....	.....	16	1	46
.....	7	.....	.....	13	280	22	6	1	.....	20	5	54
4	4	.....	.....	7	309	32	7	2	8	23	7	79
3	3	20	1	17	402	39	17	3	3	40	9	111
165	6	4	.....	23	605	41	21	4	3	41	12	122
27	6	1	2	23	465	45	18	2	2	33	9	109
.....	3	3	1	3	374	34	13	2	1	20	7	77
10	1	8	.....	7	366	34	10	2	.....	43	11	100
.....	3	.....	.....	23	458	26	15	2	3	34	10	90
1	4	5	.....	8	422	40	12	2	.....	37	9	100
37	8	12	.....	10	436	57	18	4	.....	.....	27	106
247	50	53	4	145	4,253	392	144	24	20	307	107	994

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TABLE 35.—***FATALITIES:*** *By kinds of mines and causes,*

Kind of mine.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Copper:										
1921	2						1		3	6
1920		1					1		4	6
1919	1		1	2					1	5
1918	2	1		2			2	4	5	16
1917	4	3						1	1	9
1916	3	3		4			1	5	5	21
1915	1	3		2				1	17	24
1914	2	2		1					3	8
1913	1	2					2	3	1	9
1912	1	5		4			3	3	15	31
1911		3	1				1	3	14	22
Gold and miscellaneous metal:										
1921	2			4				1	5	12
1920	2						1	4	8	15
1919				2		1		2	5	10
1918		1		2	1		4	2	7	17
1917				8			4	2	12	26
1916	1	1		3			5	2	13	25
1915	2	1					1	5	2	11
1914		2	2				3	2	2	11
1913	2	1		2	1		1	5	6	18
1912	3						1	5	3	12
1911	3		1				1	3	17	25
Iron:										
1921	1			1		1			3	6
1920	3	4					2	2	3	14
1919	1	7		5			1	1	2	17
1918	3	4					1	1	2	11
1917	3	2		2				2	11	20
1916	5	1	1	6	1			2	4	20
1915	1	2	1						3	7
1914	1	1	2	3			1	1	2	11
1913	4		2	3			1	1	4	15
1912	2		2	2			1	1	1	9
1911	1	2	1					2	4	10
Lead and zinc (Mississippi Valley):										
1921										
1920				1					2	3
1919				2			1			3
1918				1			1		2	4
1917				1			1		1	3
1916				2			1	1	1	5
1915				1					3	4
1914								1	1	2
1913	2	1					1	2		6
1912								1	4	5
1911		3							7	10
Nonmetallic mineral:										
1921	1	1					1	1		4
1920		4	1	1			3	3	3	15
1919		1	1				3	1	1	7
1918	1	2	1			1		2		7
1917		2		2			1	1	1	7
1916			1			1		2	1	5
1915		1	1							2
1914		2	1				2			5
1913									1	1
1912								1	1	2
1911										
Total, United States:										
1921	6	1		5		1	2	2	11	28
1920	5	9	1	2			7	9	20	53
1919	2	8	2	11		1	5	4	9	42
1918	6	8	1	5	1	1	8	9	16	55
1917	7	7		13			6	6	26	65
1916	9	5	2	15	1	1	7	12	24	76
1915	4	7	2	3			1	6	25	48
1914	3	7	5	4			6	4	8	37
1913	9	4	2	5	1		5	11	12	49
1912	6	5	2	6			5	11	24	59
1911	4	8	3				2	8	42	67
Total, 11 years	61	69	20	69	3	4	54	82	217	579

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during the years ended December 31, ***1911 to 1921***—Continued.

Open pit.												
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.	Grand total.
31	32	33	34	35	36	37	38	39	40	41		
												55
	6	7	1							1	15	128
8	2	2	2					1			15	140
7	11	5								1	24	220
4	1	8									13	374
5	6	7						1		2	21	230
2		6		1							9	176
1	6	3									10	165
4	6	12					2				24	236
3	13	4	2							1	23	239
7	5	2		1			2				17	238
												78
	1		1								2	117
2				1							3	126
2	1	1			1	1	2			4	12	181
	1	1		1						1	4	196
		1					1				2	217
6	5	1		3			2	2		1	20	199
3	3	1		2	1		1	2		1	14	179
1	2	1			1		3	2		2	12	210
5	1	4	2	1			1	1		2	17	176
3				1						1	5	193
1	1	5	4		2	1					14	65
1		1	2	1				1			6	106
5	2	4	3	1							15	139
5	20	9	2	1						3	40	179
11	8	13	2	1							36	191
2	6	5	1		1					1	16	169
2	1	11	1	1	1					1	18	103
7	2	5	1	1			1				17	148
8	3	11	2	1			2	1			28	165
5	5	11		1	2		2			1	27	172
22	10	14	1		1		1			2	51	197
												14
												36
												45
												47
												68
												57
		1								1	2	60
										1	1	40
1	1						1			1	4	42
							1				1	54
							1				1	43
3	2									1	6	18
3	6		1	2				1		2	15	38
1	3						1				5	18
	1							1			2	19
2		1						2		2	7	23
1	3			2				1		1	8	24
2				1				1		1	5	15
7				1			3	1		2	14	27
3		6					2	2		5	18	30
3	2	1		1			2			3	12	20
3	1	5		1			1			1	12	24
4	3	5	4		2	1				1	20	230
4	13	8	5	3				2		3	38	425
16	7	6	5	2			1	1			38	468
14	33	15	2	1	1	1	2	1		8	78	646
17	10	23	2	2			1	2		3	60	852
8	15	13	1	2	1		1	2		4	47	697
12	6	19	1	6	1		2	3		4	54	553
18	11	9	1	4	1		5	3		4	56	559
17	12	30	2	1	1		10	5		8	86	683
16	21	20	4	3	2		6	1		7	80	661
35	16	21	1	3	1		5			4	86	695
161	147	169	28	27	10	2	33	20		46	643	6,469

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TABLE 36.—***INJURIES:*** *By kinds of mines and causes,*

Kind of mine.	Underground.									
	Fall of rock or ore from roof or wall.	Rock or ore while loading at working face.	Timber or hand tools.	Explosives.	Haulage accidents.	Falling down chute, winze, raise, or stope.	Run of ore from chute or pocket.	Drilling accidents.	Electricity.	Machinery (not including locomotives or drills).
	1	2	3	4	5	6	7	8	9	10
Copper:										
1921	**863**	**678**	**428**	**61**	**521**	**139**	**118**	**200**	**9**	**43**
1920	2,450	1,243	1,032	135	1,221	273	173	597	12	72
1919	2,813	1,290	1,045	154	1,269	233	230	417	20	66
1918	4,852	2,304	1,722	196	2,250	537	452	874	34	83
1917	4,500	2,351	1,760	223	2,142	446	246	802	25	134
1916	4,758	2,484	2,078	280	2,070	495	658	723	25	133
1915	3,329	1,902	1,289	124	1,493	374	300	962	26	307
1914	3,015	1,903	1,103	125	1,343	434	318	580	21	60
1913	3,216	1,014	1,589	124	1,499	555	479	511	12	135
1912	3,740	1,611	1,185	105	1,142	556	541	626	19	193
1911	3,273	.....	788	96	1,853	549	489	564	14	324
Gold and Miscellaneous Metal:										
1921	**922**	**491**	**511**	**61**	**473**	**220**	**54**	**454**	**12**	**46**
1920	990	575	524	99	522	220	115	474	11	34
1919	1,074	682	414	77	493	215	58	406	9	41
1918	1,035	730	453	76	656	249	58	379	27	69
1917	1,123	679	548	108	615	308	141	502	25	192
1916	2,017	1,089	729	146	929	346	138	695	28	57
1915	1,512	948	846	83	761	309	195	613	21	51
1914	1,225	472	528	72	609	223	146	416	4	64
1913	806	261	360	61	406	183	287	298	8	68
1912	893	244	394	64	409	158	246	251	5	56
1911	978	.....	269	90	326	119	275	258	4	71
Iron:										
1921	**632**	**497**	**501**	**38**	**499**	**98**	**32**	**270**	**23**	**50**
1920	1,441	1,157	983	97	1,101	133	123	386	28	117
1919	1,727	947	999	69	1,067	179	91	343	33	77
1918	1,579	929	880	228	1,015	170	103	285	33	92
1917	1,846	1,413	1,202	107	1,586	209	165	455	26	64
1916	2,053	1,304	1,260	322	1,645	155	178	509	33	68
1915	1,430	920	981	76	1,135	123	161	406	16	48
1914	1,532	877	1,002	85	1,110	142	179	373	20	53
1913	2,448	968	1,754	154	1,730	202	349	557	37	227
1912	2,036	791	1,206	193	1,485	188	238	591	12	102
1911	2,556	.....	964	147	1,154	192	203	443	11	227
Lead and zinc (Mississippi Valley):										
1921	**243**	**457**	**25**	**35**	**267**	**33**	**13**	**185**	**7**	**45**
1920	369	852	81	37	442	47	24	289	9	80
1919	554	516	69	41	384	69	9	266	10	23
1918	480	805	86	47	449	49	7	315	21	39
1917	528	776	90	54	433	103	37	363	6	17
1916	651	960	117	50	527	63	44	302	3	67
1915	323	640	83	44	308	37	25	169	6	41
1914	303	239	72	44	193	20	6	90	3	22
1913	206	285	77	22	134	6	3	112	.....	48
1912	299	453	60	26	228	37	16	124	2	109
1911	386	.....	36	34	157	45	12	121	4	49
Nonmetallic mineral:										
1921	**57**	**180**	**22**	**37**	**89**	**11**	.....	**46**	**6**	**13**
1920	69	85	15	38	109	12	2	56	5	15
1919	31	90	29	22	77	15	3	42	6	10
1918	27	54	12	8	63	5	1	28	3	12
1917	35	114	18	7	49	8	1	25	3	11
1916	56	114	11	12	55	1	.....	24	.....	7
1915	29	66	11	15	35	4	1	7	.....	2
1914	29	62	25	8	48	4	.....	29	4	5
1913	38	56	15	15	65	1	.....	22	2	9
1912	16	35	11	11	47	2	.....	21	1	11
1911	63	.....	6	14	40	3	2	11	.....	11
Total, United States:										
1921	**2,717**	**2,303**	**1,487**	**232**	**1,849**	**501**	**217**	**1,155**	**57**	**197**
1920	5,319	3,912	2,635	406	3,395	685	437	1,802	65	318
1919	6,199	3,525	2,556	363	3,290	711	391	1,474	78	217
1918	7,973	4,822	3,153	555	4,433	1,010	621	1,881	118	295
1917	8,032	5,333	3,618	499	4,825	1,074	590	2,147	85	418
1916	9,535	5,951	4,195	810	5,226	1,060	1,018	2,253	89	332
1915	6,623	4,476	3,210	342	3,732	847	682	2,157	69	449
1914	6,104	3,553	2,730	334	3,303	823	649	1,488	52	204
1913	6,714	2,584	3,795	376	3,834	917	1,118	1,500	59	487
1912	6,984	3,134	2,856	399	3,311	941	1,041	1,613	39	471
1911	7,256	.....	2,063	381	3,530	908	981	1,397	33	682
Total, 11 years	**73,456**	**39,593**	**32,298**	**4,697**	**40,728**	**9,507**	**7,745**	**18,867**	**744**	**4,070**

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during the years ended December 31, 1911 to 1921.

Underground—Continued.						Shaft.						
Mine fires.	Suffocation from natural gases.	Inrush of water.	Stepping on nail.	Other causes.	Total, underground.	Falling down shafts.	Objects falling down shafts.	Breaking of cables.	Overwinding.	Skip or cage.	Other causes.	Total, shaft.
11	12	13	14	15		16	17	18	19	20	21	
.....	1	.....	84	794	3,939	11	42	.....	1	49	31	134
.....	11	.....	231	1,939	9,389	18	49	3	.....	50	115	235
4	42	1	186	1,930	9,700	17	63	14	2	64	142	302
4	36	3	405	3,055	16,807	21	132	9	1	122	109	394
39	31	3	296	3,172	16,170	18	121	3	1	90	129	362
2	13	.....	237	2,391	16,347	41	89	.....	1	57	108	296
12	18	.....	227	1,880	12,243	26	97	1	.....	61	98	283
1	3	.....	108	1,779	10,793	16	71	.....	.....	90	69	246
9	5	3	120	1,394	10,665	35	99	2	3	74	60	273
6	3	1	130	1,630	11,488	63	110	.....	.....	79	38	290
7	8	.....	.....	682	8,647	23	56	5	3	.....	62	149
.....	20	.....	157	871	4,292	17	33	.....	.....	51	46	147
.....	12	.....	151	875	4,602	18	57	2	3	59	53	192
37	7	.....	160	755	4,428	24	49	4	6	77	68	228
.....	6	136	105	1,248	5,227	19	43	6	1	64	69	202
3	14	1	191	2,351	6,801	29	65	8	3	107	131	343
5	16	1	213	1,542	7,951	56	91	4	3	108	112	374
14	36	13	212	1,177	6,791	21	45	2	1	84	46	199
5	11	.....	36	704	4,515	15	39	9	1	43	34	141
1	10	1	36	412	3,198	18	35	2	2	42	28	127
6	14	1	26	413	3,180	15	46	3	2	38	27	131
7	4	9	.....	699	3,109	18	34	.....	13	.....	58	123
.....	4	.....	68	332	3,044	8	13	.....	.....	29	32	82
6	29	.....	154	810	6,565	22	44	2	3	67	31	169
6	14	6	152	994	6,704	19	32	.....	4	67	81	203
.....	1	1	156	1,120	6,592	9	57	2	.....	106	92	266
3	9	.....	198	1,313	8,596	22	49	4	2	96	103	276
.....	6	3	178	1,231	8,945	24	62	.....	2	112	101	301
1	11	.....	131	964	6,403	11	70	1	.....	80	66	228
.....	8	12	80	901	6,374	12	48	.....	2	86	63	211
1	6	13	142	1,015	9,603	38	85	5	3	87	43	261
.....	18	8	71	651	7,590	18	91	2	1	96	56	264
6	4	1	.....	1,721	7,629	40	77	.....	8	.....	90	215
.....	5	.....	28	477	1,820	1	25	.....	.....	9	20	55
.....	13	1	81	697	3,022	14	76	.....	2	76	33	201
23	9	.....	38	660	2,671	8	61	.....	2	58	22	151
.....	13	3	96	492	2,902	20	73	1	.....	94	55	243
.....	10	.....	118	858	3,393	16	214	2	2	81	69	384
14	3	.....	115	668	3,584	9	101	1	1	81	67	260
15	13	21	113	410	2,248	3	56	1	1	33	28	122
.....	.....	.....	8	375	1,375	7	24	.....	.....	39	30	100
1	.....	.....	17	167	1,078	6	26	.....	.....	14	17	63
.....	.....	.....	14	285	1,653	8	30	1	2	32	22	95
4	2	3	.....	310	1,163	11	88	2	2	.....	34	137
.....	2	.....	6	136	605	15	1	.....	.....	2	4	22
.....	1	.....	7	142	556	.....	3	.....	1	.....	11	15
.....	.....	.....	2	74	401	2	4	.....	.....	1	6	13
.....	.....	.....	6	106	325	2	2	.....	.....	2	3	9
.....	.....	.....	11	144	426	.....	1	.....	.....	.....	3	4
.....	.....	.....	7	90	377	2	4	.....	.....	2	6	14
.....	4	.....	3	31	208	.....	3	.....	.....	1	.....	4
.....	.....	.....	2	24	240	.....	.....	.....	.....	2	.....	2
.....	.....	.....	3	22	248	3	4	.....	.....	2	.....	9
.....	.....	.....	.....	13	168	.....	1	.....	.....	.....	.....	1
.....	.....	1	.....	53	204	1	1	.....	.....	.....	.....	2
.....	32	.....	343	2,610	13,700	52	114	.....	1	140	133	440
6	66	1	624	4,463	24,134	72	229	7	9	252	243	812
70	72	7	538	4,413	23,904	70	209	18	14	267	319	897
4	56	143	768	6,021	31,853	71	307	18	2	388	328	1,114
45	64	4	814	7,838	35,386	85	450	17	8	374	435	1,369
21	38	4	750	5,922	37,204	132	347	5	7	360	394	1,245
42	82	34	686	4,462	27,893	61	271	5	2	259	238	836
6	22	12	234	3,783	23,297	50	182	9	3	260	196	700
12	21	17	318	3,010	24,792	100	249	9	8	219	148	763
12	35	10	241	2,992	24,079	104	278	6	5	245	143	781
24	18	14	.....	3,465	20,752	93	256	7	26	.....	244	626
242	506	246	5,316	48,979	286,994	890	2,892	101	85	2,764	2,821	9,553

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TABLE 36.—*INJURIES: By kinds of mines and causes,*

Kind of mine.	Surface.									
	Mine cars, mine locomotives, or aerial trams.	Railway cars and locomotives.	Run or fall of ore in or from ore bins.	Falls of persons.	Stepping on nail.	Hand tools, axes, bars, etc.	Electricity.	Machinery.	Other causes.	Total, surface.
	22	23	24	25	26	27	28	29	30	
Copper:										
1921	**25**	**12**	**8**	**48**	**18**	**67**	**7**	**46**	**264**	**495**
1920	69	19	31	142	69	161	6	112	863	1,472
1919	120	26	33	137	71	167	9	100	658	1,321
1918	107	47	41	207	93	316	26	188	976	2,001
1917	145	62	45	207	79	303	8	139	1,061	2,049
1916	137	40	44	211	80	218	22	161	1,131	2,044
1915	62	29	34	134	67	190	5	134	789	1,444
1914	105	22	40	100	42	188	10	107	372	986
1913	74	27	30	87	25	181	8	123	349	904
1912	63	29	37	129	20	159	6	204	261	908
1911	33	16	62	.....	.....	.....	15	77	536	739
Gold and miscellaneous metal:										
1921	**35**	**8**	**8**	**119**	**39**	**146**	**9**	**106**	**407**	**877**
1920	98	17	12	95	52	131	13	99	318	835
1919	77	14	1	89	25	98	13	70	352	739
1918	102	23	12	251	189	197	19	239	1,109	2,141
1917	75	21	19	105	96	131	19	123	437	1,026
1916	134	28	19	131	88	179	15	145	552	1,291
1915	81	15	21	114	67	132	33	116	342	921
1914	45	28	14	49	19	93	6	71	205	530
1913	34	3	8	33	11	52	4	78	84	307
1912	28	6	5	32	28	51	14	55	97	316
1911	43	5	10	.....	.....	.....	6	58	155	277
Iron:										
1921	**25**	**18**	**19**	**77**	**52**	**110**	**11**	**62**	**256**	**630**
1920	91	96	20	175	89	214	22	123	498	1,328
1919	137	82	6	182	74	248	11	116	522	1,378
1918	97	44	17	142	61	187	6	123	593	1,270
1917	136	70	28	190	114	254	17	143	745	1,697
1916	131	69	20	176	87	216	10	151	661	1,521
1915	54	27	17	113	51	175	5	93	413	948
1914	84	30	22	196	55	185	7	114	437	1,130
1913	46	44	12	221	65	408	10	164	457	1,427
1912	56	41	59	208	47	315	9	172	274	1,181
1911	91	29	35	.....	.....	.....	1	188	441	785
Lead and zinc (Mississippi Valley):										
1921	**2**	**3**	.....	**8**	**5**	**10**	.....	**17**	**139**	**184**
1920	16	8	7	31	45	50	3	67	156	383
1919	11	7	6	24	18	32	2	18	245	363
1918	35	17	15	37	47	51	5	72	313	592
1917	31	26	24	54	84	83	7	131	291	731
1916	34	25	30	102	96	93	6	98	376	860
1915	14	9	24	24	42	35	5	27	105	285
1914	14	7	11	16	15	39	2	24	146	274
1913	2	55	2	28	25	32	.....	45	81	270
1912	21	1	19	22	19	36	.....	37	74	229
1911	13	6	9	.....	.....	.....	1	53	85	167
Nonmetallic mineral:										
1921	**19**	**42**	**1**	**82**	**139**	**133**	**16**	**70**	**423**	**925**
1920	24	27	8	83	146	137	7	159	435	1,026
1919	49	19	3	92	31	83	14	211	339	841
1918	47	33	5	35	61	77	13	76	337	684
1917	24	44	7	37	47	48	4	41	250	502
1916	40	14	12	38	97	117	5	47	174	544
1915	7	7	6	27	39	44	1	24	120	275
1914	9	6	8	26	14	21	1	17	94	196
1913	10	.....	2	7	1	7	.....	8	7	42
1912	2	2	.....	2	9	1	.....	5	20	41
1911	5	1	.....	.....	.....	.....	.....	5	13	24
Total, United States:										
1921	**106**	**83**	**36**	**334**	**253**	**466**	**43**	**301**	**1,489**	**3,111**
1920	298	167	78	526	401	693	51	560	2,270	5,044
1919	394	148	49	524	219	628	49	515	2,116	4,642
1918	388	164	90	672	451	828	69	698	3,328	6,688
1917	411	223	123	593	420	819	55	577	2,784	6,005
1916	476	176	125	658	448	823	58	602	2,894	6,260
1915	218	87	102	412	266	576	49	394	1,769	3,873
1914	257	93	95	387	145	526	26	333	1,224	3,116
1913	166	129	54	376	127	680	22	418	978	2,950
1912	170	79	120	393	123	562	29	473	726	2,675
1911	185	57	116	.....	.....	.....	23	381	1,230	1,992
Total, 11 years	3,069	1,406	988	4,875	2,853	6,601	474	5,252	20,838	46,356

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during the years ended December 31, 1911 to 1921—Continued.

Open pit.												
Falls or slides of rock or ore.	Explosives.	Haulage accidents (locomotives, etc.).	Steam shovels.	Falls of persons.	Falls of derricks, booms, etc.	Run or fall of ore in or from ore bins.	Machinery (other than locomotives or steam shovels).	Electricity.	Hand tools.	Other causes.	Total, open pit.	Grand total.
31	32	33	34	35	36	37	38	39	40	41		
24	3	20	6	19	1	.....	4	.....	22	55	154	4,722
83	24	70	72	66	3	.....	38	3	127	465	951	12,047
153	17	134	74	62	2	1	17	1	100	352	913	12,236
275	37	126	77	115	3	3	55	.....	126	494	1,311	20,513
304	24	117	67	147	8	4	37	1	84	561	1,354	19,935
316	8	111	36	46	2	1	27	3	79	852	1,481	20,168
343	23	113	52	124	3	2	35	2	76	511	1,284	15,254
303	84	162	52	146	1	1	60	4	92	437	1,342	13,367
361	93	134	67	181	1	3	49	3	112	517	1,521	13,363
244	66	104	104	99	30	.....	41	5	27	231	951	13,637
225	52	89	45	112	37	.....	171	4	.....	72	807	10,342
5	.....	4	3	3	.....	1	3	.....	8	9	36	5,352
13	2	9	5	6	3	.....	2	.....	11	24	75	5,704
13	.....	12	2	9	.....	.....	7	.....	9	22	74	5,469
31	8	22	2	41	22	7	19	3	30	92	277	7,847
43	11	23	.....	10	.....	1	11	1	22	93	215	8,385
36	4	11	.....	84	.....	.....	137	2	110	234	618	10,234
45	7	2	.....	55	3	1	91	5	69	188	466	8,377
45	5	7	.....	32	.....	5	97	3	120	101	415	5,601
31	6	10	35	27	3	1	9	3	38	60	223	3,855
36	2	3	17	23	3	1	8	1	46	26	166	3,793
16	7	10	6	24	6	2	10	3	.....	25	109	3,618
71	9	93	86	90	7	5	21	.....	86	283	751	4,507
145	28	129	125	71	11	1	36	1	128	335	1,010	9,072
107	20	79	160	47	9	1	25	.....	100	265	813	9,098
177	32	264	153	110	9	5	40	1	144	558	1,493	9,621
206	65	269	233	143	3	16	51	1	211	511	1,709	12,278
145	40	200	144	93	3	10	26	4	123	349	1,137	11,904
126	13	94	42	67	3	6	8	.....	113	286	758	8,337
143	35	126	100	101	9	.....	19	.....	140	385	1,058	8,773
361	90	264	244	151	30	22	70	2	350	598	2,182	13,473
249	88	211	177	147	7	5	60	.....	242	286	1,472	10,507
258	80	351	193	206	34	10	108	4	.....	849	2,093	10,722
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	3	2,062
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3,607
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,185
1	.....	.....	8	.....	.....	.....	.....	.....	.....	.....	9	3,746
3	.....	17	.....	.....	.....	1	.....	.....	3	12	36	4,544
13	1	25	2	3	.....	3	1	.....	5	16	69	4,773
4	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	6	2,661
1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2	1,751
8	2	1	1	1	.....	1	1	.....	2	8	25	1,436
2	.....	.....	3	1	5	2	.....	4	.....	2	19	1,996
2	1	2	.....	2	2	1	4	.....	.....	7	21	1,488
43	14	30	10	33	4	.....	28	3	32	212	409	1,961
38	36	59	20	28	5	.....	80	3	62	204	535	2,132
22	12	21	2	42	5	1	27	1	14	116	263	1,518
17	25	8	5	12	.....	2	12	2	6	81	170	1,188
23	18	17	9	11	.....	2	9	1	19	103	212	1,144
31	7	30	4	21	.....	6	17	3	30	74	223	1,158
18	3	18	1	9	1	6	33	3	18	69	179	666
49	6	34	1	18	4	2	32	1	38	101	286	724
81	12	70	5	59	8	1	60	6	46	197	545	844
26	18	60	7	61	3	1	63	3	60	289	591	801
19	10	48	.....	3	.....	.....	59	1	.....	37	177	407
143	26	147	105	145	12	6	56	3	148	562	1,353	18,604
280	90	267	222	171	22	1	156	7	328	1,028	2,572	32,562
295	49	246	238	160	16	3	76	2	223	755	2,063	31,506
501	102	420	245	278	34	17	126	6	306	1,225	3,260	42,915
579	118	443	309	311	11	24	108	4	339	1,280	3,526	46,286
541	60	377	186	247	5	20	208	12	347	1,525	3,528	48,237
536	46	229	95	255	10	15	167	10	276	1,054	2,693	35,295
541	130	329	153	298	14	8	208	8	390	1,024	3,103	30,216
842	203	479	352	419	42	28	189	14	548	1,380	4,496	32,971
557	174	378	308	331	48	9	172	13	375	834	3,199	30,734
520	150	500	244	317	79	13	352	12	.....	990	3,207	26,577
5,335	1,148	3,815	2,457	2,962	293	144	1,818	91	3,280	11,657	33,000	375,903

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TABLE 37.—***ALL MINES, 1920:*** *Men employed and number killed, by States, during the year ended December 31, 1920.*

State.	Number of employees.			Number killed.		
	Underground.	On the surface.	Total.	Underground.	On the surface.	Total.
Alabama	4,315	2,807	**7,122**	25	.....	**25**
Alaska	1,030	1,642	**2,672**	7	.....	**7**
Arizona	10,261	4,367	**14,628**	42	10	**52**
Arkansas	9	846	**855**	.....	2	**2**
California	3,393	1,496	**4,889**	24	2	**26**
Colorado	3,507	1,252	**4,759**	18	7	**25**
Connecticut	10	34	**44**	1	.....	**1**
Florida	27	4,537	**4,564**	.....	17	**17**
Georgia	108	418	**526**	.....	.....	.....
Idaho	2,846	1,113	**3,959**	12	.....	**12**
Illinois	390	307	**697**	4	1	**5**
Iowa	342	37	**379**	.....	.....	.....
Kansas	923	396	**1,319**	2	1	**3**
Kentucky	271	167	**438**	.....	.....	.....
Maine	.....	129	**129**	.....	.....	.....
Maryland	.....	69	**69**	.....	.....	.....
Massachusetts	25	9	**34**	.....	.....	.....
Michigan	16,784	7,830	**24,614**	45	4	**49**
Minnesota	5,945	10,194	**16,139**	25	17	**42**
Missouri	2,896	1,237	**4,133**	12	.....	**12**
Montana	8,406	2,394	**10,800**	43	2	**45**
Nevada	2,321	1,449	**3,770**	10	2	**12**
New Hampshire [1]	.....	.....	.....	.....	.....	.....
New Jersey	1,287	459	**1,746**	1	.....	**1**
New Mexico	1,662	1,552	**3,214**	6	1	**7**
New York	2,100	1,067	**3,167**	11	3	**14**
North Carolina	113	286	**399**	.....	1	**1**
Ohio	157	41	**198**	.....	.....	.....
Oklahoma	3,391	651	**4,042**	10	1	**11**
Oregon	295	215	**510**	1	.....	**1**
Pennsylvania	28	303	**331**	.....	.....	.....
South Carolina [1]	.....	.....	.....	.....	.....	.....
South Dakota	881	651	**1,532**	4	1	**5**
Tennessee	1,380	1,433	**2,813**	5	.....	**5**
Texas	237	1,487	**1,724**	.....	6	**6**
Utah	3,217	1,748	**4,965**	15	12	**27**
Vermont	57	43	**100**	2	.....	**2**
Virginia	589	894	**1,483**	1	.....	**1**
Washington	476	379	**855**	3	.....	**3**
Wisconsin	1,520	637	**2,157**	5	.....	**5**
Wyoming	128	167	**295**	.....	.....	.....
Other States	58	455	**513**	.....	1	**1**
Total, 1920	**81,385**	**55,198**	**136,583**	**334**	**91**	**425**
Total, 1919	90,831	54,431	**145,262**	388	80	**468**

[1] Not segregated.

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TABLE 38.—***ALL MINES:*** *Number of active operators, by States, 1916 to 1921.*

State.	1916	1917	1918	1919	1920	1921
Alabama	22	42	38	31	23	15
Alaska	428	362	270	438	385	434
Arizona	445	450	321	304	299	280
Arkansas	23	38	21	12	10	6
California	840	628	389	293	283	201
Colorado	738	407	450	461	452	344
Connecticut	3	3	3	3	3	(1)
Florida	14	15	14	18	21	18
Georgia	26	29	20	18	16	11
Idaho	510	414	282	278	331	314
Illinois	7	11	8	10	7	6
Iowa	9	8	6	5	6	7
Kansas	29	28	26	19	21	15
Kentucky	8	25	15	13	14	9
Maine	4	5	(1)	4	5	3
Maryland	10	12	8	5	6	4
Massachusetts	3	3	3	3	3	3
Michigan	76	86	70	60	59	49
Minnesota	63	66	62	57	53	41
Missouri	159	210	101	45	35	17
Montana	328	284	216	195	196	189
Nevada	406	405	414	406	297	277
New Hampshire	3	6	9	5	(1)	4
New Jersey	7	6	6	6	6	5
New Mexico	123	135	92	89	90	79
New York	37	33	31	29	26	22
North Carolina	23	23	25	16	18	11
Ohio	5	4	(1)	3	3	3
Oklahoma	37	42	51	49	49	29
Oregon	210	183	140	104	118	118
Pennsylvania	21	19	18	14	10	8
South Carolina	3	3	(1)	(1)	(1)	(1)
South Dakota	65	64	48	38	35	30
Tennessee	25	32	37	24	24	16
Texas	11	12	14	11	11	9
Utah	223	233	178	125	177	160
Vermont	7	7	7	6	5	4
Virginia	27	36	40	30	24	15
Washington	176	168	112	106	110	99
Wisconsin	51	53	50	25	22	16
Wyoming	49	42	31	19	19	19
Other States	4	5	10	6	9	6
Total	**5,258**	**4,637**	**3,636**	**3,383**	**3,281**	**2,896**

[1] Not segregated.

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TABLE 39.—***ALL MINES:*** *Men employed and the equivalent in 300-day workers, 1917 to 1921.*

State.	Actual number.					Number 300-day workers.				
	1917	1918	1919	1920	1921	1917	1918	1919	1920	1921
Alabama	9,088	7,975	8,001	7,122	4,830	8,464	7,993	8,111	7,101	2,806
Alaska	7,576	5,510	3,076	2,672	2,736	5,567	4,589	2,537	2,373	2,064
Arizona	22,492	19,391	14,709	14,628	6,988	22,464	21,555	14,503	15,510	5,585
Arkansas	1,573	795	461	855	221	1,359	582	402	802	151
California	10,123	9,750	6,064	4,889	4,737	11,390	9,750	5,627	4,721	4,499
Colorado	7,549	8,423	6,509	4,759	3,808	7,550	8,423	4,629	4,310	3,271
Connecticut	115	79	65	44	(1)	115	77	61	36	(1)
Florida	2,501	2,582	3,487	4,564	3,283	2,460	2,739	2,040	4,359	2,353
Georgia	915	745	300	526	258	805	601	226	351	145
Idaho	6,130	4,464	3,482	3,959	3,375	5,541	4,137	2,921	3,859	2,810
Illinois	677	665	639	697	581	608	579	587	675	189
Iowa	295	362	550	379	295	244	253	491	329	208
Kansas	901	1,112	985	1,319	868	690	804	890	1,170	587
Kentucky	705	504	282	438	330	478	441	164	379	253
Maine	113	(1)	114	129	32	112	(1)	95	97	22
Maryland	129	70	58	69	35	118	53	51	64	13
Massachusetts	51	33	29	34	28	49	31	27	32	21
Michigan	32,523	33,236	28,286	24,614	15,951	32,036	32,914	27,112	24,351	11,843
Minnesota	21,820	20,378	16,106	16,139	11,414	20,706	19,704	14,548	16,112	9,176
Missouri	12,006	6,063	4,884	4,133	4,079	10,107	5,250	3,627	4,340	3,933
Montana	16,264	17,858	10,535	10,800	5,262	16,218	18,266	10,503	10,877	5,137
Nevada	6,855	5,689	4,040	3,770	3,385	6,863	6,827	4,847	3,840	3,027
New Hampshire	81	92	44	(1)	58	71	63	33	(1)	43
New Jersey	2,192	2,201	1,842	1,746	1,162	2,065	2,200	1,726	1,531	687
New Mexico	4,974	3,994	3,324	3,214	2,349	4,973	3,886	3,252	3,099	1,192
New York	3,905	3,648	3,542	3,167	2,521	4,189	3,481	3,324	2,979	1,874
North Carolina	967	569	446	399	323	693	449	434	341	184
Ohio	221	(1)	281	198	224	133	(1)	271	187	202
Oklahoma	2,894	3,545	4,966	4,042	1,813	2,102	2,816	4,646	3,593	1,115
Oregon	1,186	1,287	585	510	487	817	843	467	355	207
Pennsylvania	514	336	350	331	304	455	291	311	319	160
South Carolina	233	(1)	(1)	(1)	(1)	168	(1)	(1)	(1)	(1)
South Dakota	2,160	1,515	1,007	1,532	1,648	2,361	1,664	1,063	1,763	1,850
Tennessee	3,535	3,601	3,208	2,813	2,221	3,204	3,175	2,820	2,644	1,510
Texas	618	1,414	1,709	1,724	760	635	1,630	1,863	2,029	688
Utah	7,933	6,901	4,599	4,965	4,001	8,620	7,825	4,991	5,083	3,980
Vermont	153	140	210	100	64	128	139	160	99	56
Virginia	2,670	2,150	2,079	1,483	1,034	2,395	1,896	1,661	1,365	874
Washington	1,098	871	992	855	428	745	613	777	787	212
Wisconsin	3,789	3,058	2,501	2,157	907	3,336	2,794	2,221	1,916	519
Wyoming	526	403	314	295	295	436	340	227	233	151
Other States	529	1,197	601	513	834	615	1,333	625	529	912
Total	**200,579**	**182,606**	**145,262**	**133,583**	**93,929**	**192,085**	**181,006**	**134,871**	**134,540**	**74,509**

[1] Not segregated.

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TABLE 40.—***ALL MINES:*** *Days of labor performed and average number of days mines were operated, by States, 1917 to 1921.*

State.	Days of labor performed.					Average days active.				
	1917	1918	1919	1920	1921	1917	1918	1919	1920	1921
Alabama	2,539,347	2,397,912	2,433,203	2,130,352	841,731	279	301	304	299	174
Alaska	1,670,175	1,376,571	760,970	711,942	619,080	220	250	247	266	226
Arizona	6,739,067	6,466,550	4,350,754	4,652,982	1,675,378	300	333	296	318	240
Arkansas	407,830	174,515	120,495	240,625	45,368	259	220	261	281	205
California	3,417,101	2,925,110	1,688,200	1,416,340	1,349,592	338	300	278	290	285
Colorado	2,264,883	2,526,935	1,388,616	1,292,861	981,175	300	300	213	272	258
Connecticut	34,456	23,030	18,400	10,752	(1)	300	292	283	244	(1)
Florida	737,887	821,690	612,081	1,307,584	706,017	295	318	176	286	215
Georgia	241,366	180,233	67,901	105,289	43,398	264	242	226	200	168
Idaho	1,662,271	1,241,089	876,233	1,157,655	842,927	271	278	252	292	250
Illinois	182,389	173,604	175,992	202,429	56,727	269	261	275	290	98
Iowa	73,304	75,997	147,241	98,540	62,288	248	210	268	260	211
Kansas	206,850	241,166	266,917	351,016	176,982	230	217	271	266	204
Kentucky	143,401	132,422	49,052	113,730	75,751	263	263	174	260	230
Maine	33,450	(1)	28,506	29,246	6,560	296	(1)	250	227	205
Maryland	35,412	15,780	15,386	19,100	3,849	275	225	265	277	110
Massachusetts	14,803	9,340	8,135	9,532	6,330	260	283	281	280	226
Michigan	9,610,957	9,871,061	8,133,432	7,305,354	3,553,013	296	297	302	297	223
Minnesota	6,211,912	5,911,146	4,364,428	4,833,593	2,752,669	285	290	271	299	241
Missouri	3,032,204	1,575,149	1,088,070	1,302,038	1,179,855	253	260	223	315	289
Montana	4,865,567	5,479,838	3,150,920	3,263,225	1,541,120	299	307	290	302	293
Nevada	2,059,054	2,047,980	1,454,010	1,151,920	908,170	300	360	360	306	268
New Hampshire	21,205	18,936	9,927	(1)	12,764	262	206	226	(1)	220
New Jersey	619,640	650,978	517,881	459,246	206,079	283	300	281	263	177
New Mexico	1,491,783	1,165,899	975,692	929,640	357,527	300	292	294	289	152
New York	1,256,601	1,044,184	997,095	893,550	562,345	322	286	282	282	223
North Carolina	207,936	134,698	130,241	102,197	55,264	215	237	292	256	171
Ohio	40,040	(1)	81,391	56,155	60,496	181	(1)	290	284	270
Oklahoma	630,504	844,840	1,393,892	1,077,911	334,477	218	238	281	267	184
Oregon	245,038	252,942	140,000	106,477	62,010	207	197	239	209	127
Pennsylvania	136,590	87,262	93,400	95,820	48,015	266	260	267	289	158
South Carolina	50,400	(1)	(1)	(1)	(1)	216	(1)	(1)	(1)	(1)
South Dakota	708,364	499,300	319,010	529,032	555,093	328	330	317	345	337
Tennessee	961,148	952,359	846,100	793,155	473,089	272	264	264	282	204
Texas	190,495	489,154	559,015	608,822	206,369	308	346	327	353	272
Utah	2,586,036	2,347,633	1,497,423	1,524,810	1,194,046	326	340	326	307	298
Vermont	38,487	41,766	48,033	29,873	16,796	252	298	229	299	262
Virginia	718,380	568,689	498,119	409,504	262,115	269	265	240	276	253
Washington	223,421	183,963	233,181	236,152	63,553	263	211	235	276	148
Wisconsin	1,000,661	838,294	666,269	574,811	155,575	264	274	266	266	172
Wyoming	130,770	101,943	68,173	69,953	45,465	249	253	217	237	154
Other States	184,626	399,790	187,566	158,660	273,644	349	334	312	309	328
Total	**57,625,811**	**54,301,748**	**40,461,350**	**40,361,893**	**22,352,702**	**287**	**297**	**281**	**296**	**238**

[1] Not segregated.

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TABLE 41.—***ALL MINES:*** *Fatalities and injuries, by States and years, 1917 to 1921.*

State.	Number killed.					Number injured.				
	1917	1918	1919	1920	1921	1917	1918	1919	1920	1921
Alabama	32	25	31	25	5	2,247	1,536	1,392	1,548	642
Alaska	30	8	10	7	13	543	206	333	257	218
Arizona	80	86	61	52	23	7,860	10,460	6,466	6,375	1,826
Arkansas	.....	1	.....	2	.....	75	36	22	85	16
California	44	54	18	26	17	2,888	3,160	1,651	1,138	1,315
Colorado	47	39	31	25	15	1,074	849	578	668	733
Connecticut	.....	.....	.....	1	(1)	13	5	2	1	(1)
Florida	7	3	5	17	5	262	211	267	742	517
Georgia	4	1	.....	.....	.....	66	17	5	18	4
Idaho	24	17	12	12	9	1,044	868	633	1,101	836
Illinois	3	3	2	5	1	151	72	80	95	16
Iowa	.....	.....	.....	.....	1	67	47	51	51	51
Kansas	4	6	3	3	1	81	142	368	413	298
Kentucky	.....	2	1	.....	.....	41	47	23	42	56
Maine	.....	.....	.....	.....	.....	1	(1)	31	12	.....
Maryland	.....	.....	.....	.....	.....	2	.....	.....	.....	1
Massachusetts	.....	.....	.....	.....	.....	.....	1	1	.....	.....
Michigan	109	109	81	49	43	8,625	6,543	5,611	5,296	2,978
Minnesota	63	64	45	42	23	4,473	3,833	3,289	2,970	1,660
Missouri	36	12	12	12	8	2,384	1,566	634	753	876
Montana	214	64	41	45	13	3,978	4,401	2,505	2,513	864
Nevada	31	33	21	12	8	1,124	1,191	447	594	570
New Hampshire	.....	1	.....	.....	.....	4	2	.....	.....	.....
New Jersey	9	10	8	1	3	377	325	304	201	83
New Mexico	13	15	13	7	2	996	669	814	652	185
New York	13	14	12	14	12	1,043	827	1,037	1,183	1,067
North Carolina	1	2	1	1	.....	106	51	50	33	1
Ohio	.....	.....	.....	.....	3	39	(1)	40	67	65
Oklahoma	18	13	17	11	3	923	1,271	1,337	1,629	699
Oregon	1	4	.....	1	2	123	124	61	126	26
Pennsylvania	.....	1	.....	.....	.....	74	17	18	16	10
South Carolina	.....	(1)	(1)	.....	(1)	8	(1)	(1)	(1)	(1)
South Dakota	7	1	5	5	1	730	476	398	468	653
Tennessee	11	13	6	5	4	627	436	744	841	445
Texas	.....	4	3	6	.....	83	233	423	435	273
Utah	26	28	15	27	10	2,385	2,119	1,165	1,516	1,149
Vermont	.....	.....	.....	2	.....	49	46	24	18	7
Virginia	8	5	4	1	2	262	152	147	81	114
Washington	4	.....	1	3	.....	280	65	91	79	10
Wisconsin	12	8	8	5	1	1,031	721	395	450	125
Wyoming	1	.....	1	.....	1	12	15	7	29	18
Other States	.....	.....	.....	1	1	135	175	62	66	197
Total	**852**	**646**	**468**	**425**	**230**	**46,286**	**42,915**	**31,506**	**32,562**	**18,604**

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TABLE 42.—***ALL MINES:*** *Fatalities and injuries per 1,000 300-day workers employed, by States, 1917 to 1921.*

State.	Number killed, per 1,000 300-day workers.					Number injured, per 1,000 300-day workers.				
	1917	1918	1919	1920	1921	1917	1918	1919	1920	1921
Alabama	3.78	3.13	3.82	3.52	1.78	265.48	192.17	171.62	218.00	228.80
Alaska	5.39	1.74	3.94	2.95	6.30	97.54	44.89	131.26	108.28	105.62
Arizona	3.56	3.99	4.21	3.35	4.12	349.89	485.27	445.84	411.02	326.95
Arkansas	.....	1.72	.....	2.49	.....	55.19	61.86	54.73	105.99	105.96
California	3.86	5.54	3.20	5.51	3.78	253.56	324.10	293.41	241.05	292.29
Colorado	6.23	4.63	6.70	5.80	4.59	142.25	100.80	124.86	154.99	224.09
Connecticut	.....	.....	.....	27.78	(1)	113.04	64.94	32.79	27.78	(1)
Florida	2.85	1.10	2.45	3.90	2.12	106.50	77.04	130.88	170.22	219.72
Georgia	4.97	1.66	.....	.....	.....	81.99	28.29	22.12	51.28	27.59
Idaho	4.33	4.11	4.11	3.11	3.20	188.41	209.81	216.71	285.31	297.51
Illinois	4.93	5.18	3.41	7.41	5.29	248.36	124.35	136.29	140.74	84.66
Iowa	.....	.....	.....	.....	4.81	274.59	185.77	103.87	155.02	245.19
Kansas	5.80	7.46	3.37	2.56	1.70	117.39	176.62	413.48	352.99	507.67
Kentucky	.....	4.54	6.10	.....	.....	85.77	106.58	140.24	110.82	221.34
Maine	.....	.....	.....	.....	.....	8.93	(1)	326.32	123.71	.....
Maryland	.....	.....	.....	.....	.....	16.95	.....	.....	.....	76.92
Massachusetts	.....	.....	.....	.....	.....	.....	32.26	37.04	.....	.....
Michigan	3.40	3.31	2.99	3.25	3.63	269.23	198.79	206.96	217.49	251.46
Minnesota	3.04	3.25	3.09	2.61	2.51	216.02	194.53	226.08	184.33	180.91
Missouri	3.56	2.29	3.31	2.76	2.03	235.88	298.29	174.80	173.50	222.73
Montana	13.20	3.50	3.90	4.14	2.53	245.28	240.94	238.50	231.04	168.19
Nevada	4.52	4.83	4.33	3.13	2.64	163.78	174.45	92.22	154.69	188.31
New Hampshire	.....	15.87	.....	.....	.....	56.34	31.75	.....	.....	.....
New Jersey	4.36	4.55	4.63	.65	4.37	182.57	147.73	176.13	131.29	120.82
New Mexico	2.61	3.86	4.00	2.26	1.68	200.28	172.16	250.31	210.39	155.20
New York	3.10	4.02	3.61	4.70	6.40	248.99	237.58	311.97	397.11	569.37
North Carolina	1.44	4.45	2.30	2.93	.....	152.96	113.59	115.21	96.77	5.43
Ohio	.....	.....	.....	.....	14.85	293.23	(1)	147.60	358.29	321.78
Oklahoma	8.56	4.62	3.66	3.06	2.69	439.11	451.35	287.77	453.38	626.91
Oregon	1.22	4.74	.....	2.82	9.66	150.55	147.09	130.62	354.93	125.60
Pennsylvania	.....	3.44	.....	.....	.....	162.64	58.42	57.88	50.16	62.50
South Carolina	.....	(1)	(1)	.....	(1)	47.62	(1)	(1)	.....	(1)
South Dakota	2.96	.60	4.70	2.84	.54	309.19	286.06	374.41	265.46	352.97
Tennessee	3.43	4.09	2.13	1.89	2.65	195.69	137.32	263.83	318.08	294.68
Texas	.....	2.45	1.61	2.96	.....	130.71	142.86	227.05	214.39	396.80
Utah	3.02	3.58	3.01	5.31	2.51	276.68	270.80	233.42	298.25	288.69
Vermont	.....	.....	.....	20.20	.....	382.81	330.94	150.00	181.82	125.00
Virginia	3.34	2.64	2.41	.73	2.29	109.39	80.17	88.50	59.34	130.43
Washington	5.37	.....	1.29	3.81	.....	375.84	106.04	117.12	100.38	47.17
Wisconsin	3.60	2.86	3.60	2.61	1.93	309.05	258.05	177.85	234.86	240.85
Wyoming	2.29	.....	4.41	.....	6.62	27.52	44.12	30.84	124.46	119.21
Other States	.....	.....	.....	1.89	1.10	219.51	131.28	99.20	124.76	216.01
Total	**4.44**	**3.57**	**3.47**	**3.16**	**3.09**	**240.97**	**237.09**	**233.60**	**242.02**	**249.69**

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STATE MINE OFFICIALS AND COMPENSATION COMMISSIONS IN THE UNITED STATES.

ALABAMA.

Name.	Designation.	Address.
Charles H. Nesbitt	Chief mine inspector	421–423 Chamber of Commerce, Birmingham.
E. E. Echols	Assistant mine inspector	District No. 1, Tuscaloosa.
George Park	do	District No. 2, Blossburg.
Jas. B. Carlin	do	District No. 3, Birmingham.
S. M. Thompson	do	District No. 4, Helena.
	do	District No. 5.
W. W. Kicker	do	District No. 6, Ensley.
Eugene A. Smith	State geologist	University of Alabama, University.

ALASKA.

B. D. Stewart	Supervising mining engineer, U. S. Bureau of Mines.	Anchorage.

ARIZONA.

G. M. Butler	Director, State bureau of mines	Tucson.
Tom Foster	State mine inspector	Phoenix.
E. F. Myers	Deputy mine inspector	Bisbee.
J. F. McManis	do	Globe.
Mathew Hall	do	Prescott.

ARKANSAS.

James G. Ferguson	Commissioner of mines, manufactures, and agriculture.	Little Rock.
Jesse Redyard	State mine inspector	413–414 First National Bank Building, Fort Smith.
Gilbert H. Cady	State geologist	University of Arkansas, Fayetteville.

CALIFORNIA.

Will J. French	Chairman, industrial accident commission	525 Market Street, San Francisco.
W. P. Ratliff	Chief statistician	Do.
H. M. Wolflin	Superintendent of safety	Do.
C. Chester Brown	Chief mining engineer	Do.
J. Wesley Gebb	Mining engineer	Do.
F. L. Lowell	do	Do.
Lloyd L. Root	State mineralogist	Ferry Building, San Francisco.

COLORADO.

Joseph C. Bell	Chairman, industrial commission	State Capitol, Denver.
Metal mines.		
Horace F. Lunt	Commissioner, bureau of mines, State of Colorado.	Do.
T. R. Hanahen	Inspector, district No. 1	Do.
M. J. McCarthy	Insepector, district No. 2	Cripple Creek.
R. J. Murray	Inspector, district No. 3	Salida.
Robert Innes	Inspector, district No. 4	Montrose.
Coal mines.		
James Dalrymple	Chief inspector of coal mines	State capitol, Denver.
Henry King	Deputy inspector	Do.
James W. Graham	do	Lafayette.
W. H. James	do	Walsenberg.
W. M. Laurie	do	Trinidad.
Hugo H. Machin	do	Aguilar.
Russell D. George	State geologist	University of Colorado, Boulder.

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CONNECTICUT.

Name.	Designation.	Address.
Frederic M. Williams	Chairman, board of compensation commissioners.	Room 4, county courthouse, Waterbury.
Henry H. Robinson	Superintendent, State geological and natural history survey.	Yale University, New Haven.

DELAWARE.

Volley M. Murray	President, industrial accident board	Ford Building, Wilmington.

FLORIDA.

Herman Gunter	State geologist, Florida State Geological Survey	Tallahassee.

GEORGIA.

H. M. Stanley	Chairman, industrial commission	Atlanta.
S. W. McCallie	State geologist, Geological Survey of Georgia	Do.

IDAHO.

George H. Fisher	Chairman, industrial accident board	Boise.
Francis A. Thomson	Secretary, bureau of mines and geology	Moscow.
Stewart Campbell	State mine inspector, mining department	Boise

ILLINOIS.

Ernest E. Withall	Chairman, industrial commission	303–318 City Hall Square Building, Chicago.
Robt. M. Medill	Director, department of mines and minerals	Springfield.
Martin Bolt	Assistant director	1600 South College Street, Springfield.
William Hutton	Member, State mining board	Duquoin.
Peter Joyce	do	Springfield.
M. S. Coleman	do	Harrisburg.
James Needham	do	Chicago.
William Hall	President, miners' examining board	Springfield.
William Hogan	Member, miners' examining board	Zeigler.
John Mulligan	Secretary, miners' examining board	Decatur.
Joseph C. Viano	Member, miners' examining board	Coal City.
Richard Neeson	Mine inspector	Illinois Hotel, Springfield.
Walter A. Waite	Mine inspector, district No. 1	422 East Erie Street, Springvalley.
William E. Kidd	Mine inspector, district No. 2	603 Columbia Terrace, Peoria
Thomas P. Back	Mine inspector, district No. 3	321 West Locust Street, Canton.
Francis J. Devlin	Mine inspector, district No. 4	142 North Eleventh Street, Springfield.
Joseph Haskins	Mine inspector, district No. 5	Catlin.
John G. Milhouse	Mine inspector, district No. 6	Box 254, Litchfield.
Henry D. Thompson	Mine inspector, district No. 7	Collinsville.
Jas. R. Richards	Mine inspector, district No. 8	214 North Twelfth Street, Belleville.
Frank Rosbottom	Mine inspector, district No. 9	Duquoin.
E. J. Hoey	Mine inspector, district No. 10	Christopher.
Thos. English	Mine inspector, district No. 11	Harrisburg.
W. L. Morgan	Mine inspector, district No. 12	Greenville.
James E. Anderson	Special mining investigator	538 East Fulton Street Farmington.
Frank W. DeWolf	Chief, State geological survey	Urbana.

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INDIANA.

Name.	Designation.	Address.
Samuel R. Artman	Chariman, Industrial Board of Indiana	Room 432, State Capitol, Indianapolis.
Cairy Littlejohn	Chief mine inspector	Room 413, State Capitol, Indianapolis.
John Ellison	Deputy mine inspector	Winslow.
Albert C. Dally	do	Knightsville.
Samuel J. Wilton	do	Carbon.
John Stevely	do	Clinton.
Thos. Gillespie	do	Bicknell.
W. N. Logan	State geologist, department of geology and natural resources	Indianapolis.

IOWA.

A. B. Funk	Industrial commissioner, workmen's compensation service	Statehouse, Des Moines.
E. M. Gray	President, Iowa State mining board	Des Moines.
W. E. Holland	Inspector, district No. 1	Albia.
R. T. Rhys	Inspector, district No. 2	Ottumwa.
Edward Sweeney	Inspector, district No. 3	Des Moines.
George F. Kay	Director, Iowa Geological Survey	Iowa City.

KANSAS.

James Sherwood	State mine inspector	Pittsburg.
William Glennon	Deputy State mine inspector	Do.
John Gilday	do	Frontenac.
Peter H. White	do	Daisy Hill.
Matt Dunn	do	Burlingame.
Mine-rescue department.		
James Sherwood	Ex-officio superintendent, rescue stations	Pittsburg.
George Farrimond	Superintendent, central rescue station	Do.
William Hislop	Superintendent Arma rescue station	Arma.
D. M. Wilcox	Superintendent, Seammon rescue station	Seammon.
Raymond C. Moore	State geologist	University of Kansas, Lawrence.

KENTUCKY.

Clyde R. Levi	Chairman, workmen's compensation board	Frankfort.
L. Blenkinsopp	Chief inspector of mines	Lexington.
William Roberts	Asst. inspector of mines, district No. 1	Madisonville.
W. H. Hunt	Asst. inspector of mines, district No. 2	Central City.
Joseph A. Lewis	Asst. inspector of mines, district No. 3	Lexington.
R. D. Collett	Asst. inspector of mines, district No. 4	Pineville.
Lacey Laxton	Asst. inspector of mines, district No. 5	Harlan.
H. C. Faulkner	Asst. inspector of mines, district No. 6	Hazard.
M. L. Wells	Asst. inspector of mines, district No. 7	Paintsville.
Grant Phillips	Asst. inspector of mines, district No. 8	Pikeville.
W. R. Jillson	State geologist and director, Kentucky Geological Survey	Frankfort.

MAINE.

Arthur L. Thayer	Chairman, industrial accident commission	Augusta.

MARYLAND.

Robert E. Lee	Chairman, State industrial accident commission.	741 Equitable Building, Baltimore.
Frank T. Powers	State mine inspector	Frostburg.
Edward B. Mathews	State geologist, Maryland Geological Survey	Johns Hopkins University, Baltimore.

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MASSACHUSETTS.

Name.	Designation.	Address.
William W. Kennard....	Chairman, industrial accident board.....	Room 272, Statehouse, Boston.

MICHIGAN.

Carl Young.....	Commissioner, department of labor and industry.	Lansing.
John Harris.....	Coal-mine inspector.....	1212 Holland Ave., Saginaw.
Michael Collins.....	Mine inspector for Gogebic County.....	Ironwood.
John Lion.....	Deputy mine inspector for Gogebic County.....	Do.
Nick Drogula.....	.....do.....	Do.
John Brinkman.....	Mine inspector for Keweenaw County.....	Ahmeek.
Gust. Keikkala.....	Deputy mine inspector for Keweenaw County...	Mohawk.
Alfred James.....	Mine inspector for Houghton County.....	Laurium.
Harry J. King.....	Deputy mine inspector for Houghton County....	Do.
Frank Comienski.....	Mine inspector for Iron County.....	Stambaugh.
James H. Yelland.....	Mine inspector for Marquette County.....	Ishpeming.
Frank L. Larson.....	Mine inspector for Dickinson County.....	Iron Mountain.
Robt. Eva, sr.....	Mine inspector for Ontonagon County.....	Greenland.
John P. Christopher.....	Mine inspector for Baraga County.....	Michigamme.
Richard A. Smith.....	State geologist.....	Lansing.

MINNESOTA.

F. A. Duxbury.....	Chairman, Minnesota industrial commission.....	612 Bremer Arcade, St. Paul.
Frank E. Hoffman.....	Chief, division of workmen's compensation.....	Do.
Ed. Smith.....	Mine inspector for St. Louis County.....	Eveleth.
W. J. Trescott.....	Mine inspector for Itasca County.....	Coleraine.
August Swanson.....	Mine inspector for Crow Wing County.....	Brainerd.
F. A. Wildes.....	Superintendent of State mines.....	1748 Hague Ave., St. Paul.

MISSISSIPPI.

E. N. Lowe.....	Director, Mississippi Geological Survey.....	Jackson.

MISSOURI.

J. E. Roberts.....	Chief mine inspector.....	Kirkville.
W. H. Castle.....	Deputy inspector.....	Fulton.
F. G. Fenix.....	.....do.....	Joplin.
Tolbert Henson.....	.....do.....	Perryville
Evert Richardson.....	.....do.....	Granby.
W. H. Crouch.....	Secretary, State bureau of mines.....	Bethany.
H. A. Buehler.....	State geologist.....	Rolla.

MONTANA.

Jerome G. Locke.....	Chairman, State industrial board.....	Helena.
George N. Griffin.....	State coal-mine inspector.....	Do.
William Maxwell.....	State metal-mine inspector.....	Do.
J. P. Rowe.....	State geologist.....	University of Montana, Missoula.

NEBRASKA.

Frank A. Kennedy.....	Secretary of labor and compensation commissioner.	State Capitol, Lincoln.
E. H. Barbour.....	State geologist.....	University of Nebraska, Lincoln.

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NEVADA.

Name.	Designation.	Address.
George D. Smith	Chairman, Nevada Industrial Commission	Carson City.
A. J. Stinson	State mine inspector	Do.
Charles Huber	Deputy mine inspector	Tonopah.
Alex. Baird	....do	Ely.

NEW JERSEY.

John Roach	Deputy commissioner of labor, department of labor.	Statehouse, Trenton.
Augustus Munson	State mine inspector	P. O. Box 311, Dover.
H. B. Kummel	State geologist	Trenton.

NEW MEXICO.

W. W. Risdon	State inspector of mines	709 West Roma Avenue, Albuquerque.
R. W. Ellis	State geologist	Do.

NEW YORK.

Henry D. Sayer	State industrial commissioner	124 East Twenty-eighth St., New York.
James L. Gernon	Director of inspections	Do.
E. B. Patton	Chief statistician, State industrial commission	Albany.
W. W. Jones	Mine inspector, State industrial commission	Do.
Robert W. Jones	Inspector of mines and tunnels, State industrial commission	124 East Twenty-eighth St., New York
Gustav Werner	Tunnel inspector, State industrial commission	Do.
John M. Clarke	State geologist	University of the State of New York, Albany.

NORTH CAROLINA.

M. L. Shipman	Commissioner of labor and printing	Raleigh.
Joseph Hyde Pratt	State geologist	Chapel Hill.

NORTH DAKOTA.

Joseph A. Kitchen	Chairman, workmen's compensation bureau	Bismarck.
A. G. Leonard	State geologist	University
John Hanwell	State mine inspector	P. O. box 271, Bismarck.

OHIO.

T. J. Duffy	Chairman, industrial commission	Columbus.
Percy Tetlow	Director, department of industrial relations	Do.
Wm. Robinett	Chief, division of mines	Do.
Dan C. Jones	Deputy inspector, district No. 1	Coalton.
Jas. Dugan	Deputy inspector, district No. 2	Logan.
Andrew Ginnan	Deputy inspector, district No. 3	Jacksonville.
Elmer Sagle	Deputy inspector, district No. 4	Roseville.
E. W. Smith	Deputy inspector, district No. 5	Byesville.
Stephen Williams	Deputy inspector, district No. 6	Uhrichsville.
Geo. H. Foster	Deputy inspector, district No. 7	Massillon.
Lot H. Jenkins	Deputy inspector, district No. 8	Martins Ferry.
Frank P. Corey	Deputy inspector, district No. 9	Flushing.
T. P. Williams	Deputy inspector, district No. 10	Belmont.
Andrew Mullen	Deputy inspector, district No. 11	Adena.
Thos. G. Reese	Deputy inspector, district No. 12	Salem.
Val E. Brown	Deputy inspector, district No. 13	Pomeroy.
Isaac Vaughn	Deputy inspector, district No. 14	Nelsonville.
J. F. Davis	Deputy inspector, district No. 15	Shawnee.
James Forgie	Deputy inspector, district No. 16	Lore City.
Edw. A. Evans	Deputy inspector, district No. 17	New Philadelphia.
P. W. Moore	Rescue-car attendant	Columbus.
J. C. Wilson	Oil and gas well inspector	Do.
J. A. Bownocker	State geologist	Geological Survey of Ohio, Columbus.

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OKLAHOMA.

Name.	Designation.	Address.
Baxter Taylor	Chairman, industrial commission	State Capitol, Oklahoma City.
Ed. Boyle	Chief mine inspector (mines, oil, and gas)	McAlester.
John O'Brien	Assistant mine inspector, district No. 1	Lehigh.
William Ogilvie	Assistant mine inspector, district No. 2	McAlester.
Miller D. Hay	Assistant mine inspector, district No. 3	East Broadway Apartments, Muskogee.
C. W. Shannon	Director, Oklahoma Geological Survey	Norman.

OREGON.

J. W. Ferguson	Chairman, State industrial accident commission	Salem.
Henry M. Parks	Director, Oregon Bureau of Mines and Geology	417 Oregon Building, Portland.

PENNSYLVANIA.

Clifford B. Connelley	Chairman, industrial board	Keystone Building, Harrisburg.
Harry A. Mackey	Chairman, workmen's compensation board	Do.
Joseph J. Walsh	Chief, department of mines	Do.
Frank Hall	Deputy, department of mines	Do.
Edward C. Malick	Chief clerk, department of mines	Do.
Anthracite inspectors.		
.....	Mine inspector, first district	
P. J. Moore	Mine inspector, second district	Carbondale.
L. M. Evans	Mine inspector, third district	Scranton.
Jenkin T. Reese	Mine inspector, fourth district	Do.
S. J. Phillips	Mine inspector, fifth district	Do.
David T. Williams	Mine inspector, sixth district	Do.
Augustus McDade	Mine inspector, seventh district	263 North Main Street, Taylor.
Robert Johnson	Mine inspector, eighth district	Pittston.
Edwin C. Curtis	Mine inspector, ninth district	West Pittston.
John B. Corgan	Mine inspector, tenth district	Kingston.
T. J. Williams	Mine inspector, eleventh district	Do.
D. T. Davis	Mine inspector, twelfth district	Wilkes-Barre.
Frank Kettle	Mine inspector, thirteenth district	Do.
.....	Mine inspector, fourteenth district	
David J. Roderick	Mine inspector, fifteenth district	Hazleton.
J. J. Stickler	Mine inspector, sixteenth district	Do.
Isaac M. Davies	Mine inspector, seventeenth district	Lansford.
E. G. Evans	Mine inspector, eighteenth district	Coaldale.
M. J. Brennan	Mine inspector, nineteenth district	Pottsville.
P. C. Fenton	Mine inspector, twentieth district	Mahanoy City.
A. B. Lamb	Mine inspector, twenty-first district	Shenandoah.
William Reid	Mine inspector, twenty-second district	Central a.
B. I. Evans	Mine inspector, twenty third district	Mount Carmel.
P. J. Friel	Mine inspector, twenty-fourth district	Shamokin.
Charles J. Price	Mine inspector, twenty-fifth district	Lykens.
Bituminous inspectors.		
Alexander McCanch	Mine inspector, first district	Monongahela.
C. B. Ross	Mine inspector, second district	Latrobe.
James D. Walker	Mine inspector, third district	Butler.
William Langan	Mine inspector, fourth district	Dubois.
Richard Maize	Mine inspector, fifth district	Uniontown.
Thomas D. Williams	Mine inspector, sixth district	Johnstown.
Charles P. McGregor	Mine inspector, seventh district	Crafton.
Joseph Knapper	Mine inspector, eighth district	Philipsburg.
Silas S. Hall	Mine inspector, ninth district	Connellsville.
Joseph Williams	Mine inspector, tenth district	Altoona.
J. J. McDonald	Mine inspector, eleventh district	Greensburg.
T. J. Lewis	Mine inspector, twelfth district	Punxsutawney.
J. I. Thomas	Mine inspector, thirteenth district	Johnstown.
David Young	Mine inspector, fourteenth district	Freeport.
W. B. Wardrop	Mine inspector, fifteenth district	Barnesboro.
W. H. Howarth	Mine inspector, sixteenth district	Brownsville.
John I. Pratt	Mine inspector, seventeenth district	5494 Hays Street, Pittsburgh.
Thomas A. Mather	Mine inspector, eighteenth district	Tyrone.
James J. Stoker	Mine inspector, nineteenth district	Irwin.
F. W. Cunningham	Mine inspector, twentieth district	Somerset.

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PENNSYLVANIA—Continued.

Name.	Designation.	Address.
C. P. Byrne	Mine inspector, twenty-first district	Charleroi.
John F. Bell	Mine inspector, twenty-second district	Dravesburg.
Edward E. Girod	Mine inspector, twenty-third district	Masontown.
Nicholas Evans	Mine inspector, twenty-fourth district	Johnstown.
Thomas S. Lowther	Mine inspector, twenty-fifth district	Indiana.
P. J. Callaghan	Mine inspector, twenty-sixth district	Bridgeville.
Harry Phython	Mine inspector, twenty-seventh district	Belle Vernon.
Thomas H. Thompson	Mine inspector, twenty-eighth district	Kittanning.
Patrick S. King	Mine inspector, twenty-ninth district	612 North Canal Street, Pittsburgh.
C. H. Croker	Mine inspector, thirtieth district	Johnstown.
George H. Ashley	State geologist, topographic and geological survey.	Harrisburg.

SOUTH DAKOTA.

Otto Ellerman	State mine inspector	Lead.
Freeman Ward	State geologist, State geological and natural history survey.	Vermilion.

TENNESSEE.

E. N. Rogers	Insurance commissioner	Nashville.
George N. Taylor	Compensation inspector	Do.
O. P. Pile	Chief mine inspector	Do.
W. H. Elliott	District mine inspector, eastern division	Rockwood.
A. J. Holden	District mine inspector, middle division	Dayton.
George B. Thom	District mine inspector, western division	Decherd.
Wilbur A. Nelson	State geologist, Tennessee State geological survey.	Nashville.

TEXAS.

J. H. Fowler	Chairman, industrial accident board	Austin.
Bruce S. Gentry	State mine inspector	P. O. box 327, Rockdale.
J. A. Udden	Director, bureau of economic geology and technology.	Austin.

UTAH.

P. A. Thatcher	Chairman, industrial commission	State Capitol, Salt Lake City.
C. A. Allen	Chief mine inspector for the commission	Do.
John Crawford	Coal mine inspector for the commission	Do.
H. G. Snyder	Metal mine inspector for the commission	Do.
Wm G. Peterson	State geologist	Agricultural College of Utah, Logan.

VERMONT.

John S. Buttles	Commissioner of industries	Montpelier.
Geo. H. Perkins	State geologist, University of Vermont	Burlington.

VIRGINIA.

John Hopkins Hall, jr	Commissioner, bureau of labor and industrial statistics.	Richmond.
A. G. Lucas	State inspector of mines, bureau of labor and industrial statistics.	Do.
William Boncer	....do....	Do.
C. A. McHugh	Chairman, industrial commission	Do.
Thomas L. Watson	Director and State geologist, Virginia Geological Survey.	Charlottesville.

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WASHINGTON.

Name.	Designation.	Address.
Edward Clifford	Chairman, industrial welfare committee, Department of labor and industries.	Olympia.
Wm. R. Reese	Chief mine inspector	421 Perkins Building, Tacoma.
Geo. T. Wake	Deputy mine inspector	Do.
Solon Shedd	Supervisor of geology	Pullman.

WEST VIRGINIA.

Lee Ott	Commissioner, State compensation commission	Charleston.
R. M. Lambie	Chief, department of mines	Do.
C. W. Stuart	Mine inspector, district No. 1	Thomas.
W. H. Sandridge	Mine inspector, district No. 2	Grafton.
Evan L. Griffiths	Mine inspector, district No. 3	Clarksburg.
William Moore	Mine inspector, district No. 4	Morgantown.
W. B. Riggleman	Mine inspector, district No. 5	Fairmont.
A. E. Lafferty	Mine inspector, district No. 6	Moundsville.
Thomas Jarrett	Mine inspector, district No. 7	Weston.
V. E. Sullivan	Mine inspector, district No. 8	Charleston.
Eli J. Mason	Mine inspector, district No. 9	Do.
Zach Evans	Mine inspector, district No. 10	Handley.
John E. Hamilton	Mine inspector, district No. 11	Eskdale.
J. A. Porter	Mine inspector, district No. 12	Gauley Bridge.
Harry Fryer	Mine inspector, district No. 13	Prince.
Robert Lilly	Mine inspector, district No. 14	Mount Hope.
W. L. McGinnis	Mine inspector, district No. 15	Beckley.
Wm. Gantz	Mine inspector, district No. 16	Mullens.
Thomas Stockdale	Mine inspector, district No. 17	Freeman.
W. D. Lee	Mine inspector, district No. 18	Maitland.
Wm. E. Prentice	Mine inspector, district No. 19	Iaeger.
S. T. Lambert	Mine inspector, district No. 20	Matewan.
J. F. White	Mine inspector, district No. 21	Logan.
C. E. Foster	Mine inspector, district No. 22	St. Albans.
C. H. Hetzel, jr	Director of mine rescue stations	Charleston.
J. D. McCune	Inspector of sand mines, etc	Martinsburg.
I. C. White	State geologist, West Virginia geological survey	Morgantown.

WISCONSIN.

Fred M. Wilcox	Chairman, industrial commission	Madison.
R. McA. Keown	Engineer, industrial commission	Do.
Arthur H. Findeisen	Mine inspector, industrial commission	Do.
W. O. Hotchkiss	Director, geological and natural history survey	Do.

WYOMING.

A. D. Hoskins	State treasurer, workmen's compensation department.	Cheyenne.
Arthur Calverley	Assistant deputy and department manager	Do.
Pete Patterson	Coal-mine inspector, district No. 1	Quealy, Rock Springs.
R. V. Hotchkiss	Coal-mine inspector, district No. 2	Sheridan.
G. B. Morgan	State geologist, Geological Survey of Wyoming	Cheyenne.

PUBLICATIONS ON MINE AND QUARRY ACCIDENT STATISTICS.

A limited supply of the following publications of the Bureau of Mines has been printed. Requests for copies should be addressed to the Director, Bureau of Mines.

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AVAILABLE FOR FREE DISTRIBUTION.

BULLETIN 115. Coal-mine fatalities in the United States, 1870–1914, with statistics of coal production, labor, and mining methods, by States and calendar years, compiled by A. H. Fay. 1916. 570 pp., 3 pls., 13 figs.

BULLETIN 196. Coal-mine fatalities in the United States, 1919, and coal-mine statistics supplementing those published in Bulletin 115, with a list of permissible explosives, lamps, and motor tests prior to January 31, 1920, by A. H. Fay. 1920. 86 pp.

TECHNICAL PAPER 194. Report of the committee on the standardization of mining statistics, compiled by A. H. Fay. 1918. 57 pp.

TECHNICAL PAPER 259. The production of explosives in the United States during the calendar year 1919, with notes on coal-mine accidents due to explosives, and a list of permissible explosives tested to March 31, 1920, by W. W. Adams. 1920. 33 pp.

TECHNICAL PAPER 275. Quarry accidents in the United States during the calendar year 1919, compiled by W. W. Adams. 1920. 66 pp.

TECHNICAL PAPER 286. Metal-mine accidents in the United States during the calendar year 1919, by W. W. Adams. 1921. 99 pp.

TECHNICAL PAPER 288. Coal-mine fatalities in the United States, 1920, by W. W. Adams. 1921. 112 pp.

TECHNICAL PAPER 291. The production of explosives in the United States during the calendar year 1920, by W. W. Adams. 1921. 44 pp., 4 figs.

TECHNICAL PAPER 299. Metal-mine accidents in the United States during the fiscal year 1920, by W. W. Adams. 1922. 99 pp.

TECHNICAL PAPER 302. Coal-mine fatalities in the United States, 1921, by W. W. Adams. 1922. 72 pp.

TECHNICAL PAPER 329. Quarry accidents in the United States during the fiscal year 1921, by W. W. Adams. 1923. 90 pp.

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BULLETIN 96. Coal-mine accidents in the United States and foreign countries, compiled by F. W. Horton. 1913. 102 pp., 3 pls., 40 figs. 25 cents.

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